Privacy Fit in Open-Plan Offices:
Its Appraisal, Associated Outcomes & Contextual Factors

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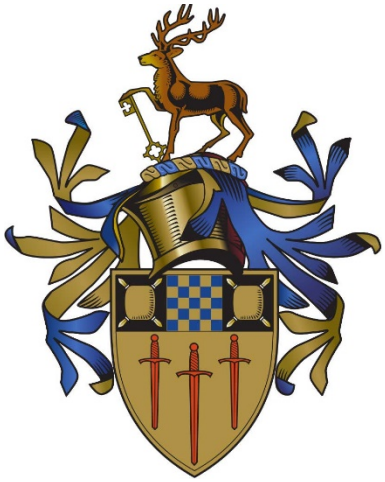

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Statement of Originality

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Summary

Poor work privacy represents a frequently reported issue in open office environments, yet relatively little is known about its consequences. In addition, prior research has limitations including weak operationalisations and measures of privacy. Therefore, this thesis developed a new work privacy measure and examined the adverse effects of poor work privacy on workers' well-being. The roles of coping appraisal and contextual factors in this relationship were explored to inform future preventative steps.

Study 1 (n = 30) qualitatively explored different scenarios of poor work privacy in an open-plan office context for the development of a new measure of privacy fit. Three dimensions of poor work privacy have been identified: acoustical and visual stimulation, interruptions, and confidentiality.

Study 2 quantitatively tested (2.A n = 195) and confirmed (2.B n = 109) the factor structure of the new privacy fit measure in two open-plan office worker samples. Four dimensions were identified: conversation confidentiality, task confidentiality, visual/acoustical stimulation, and interruptions. The measure concluded with 12 items, good model fit, reliability, and construct validity.

Study 3 (n = 220) employed the newly developed measure and quantitatively examined stress-related consequences of poor privacy fit in an open-plan office worker sample. Poor privacy fit was associated with dissatisfaction, stress, and fatigue. Coping appraisal was found to mediate these relationships.

Study 4 (n = 61) quantitatively demonstrated in a longitudinal study that a move to an activity-based office influenced workers' privacy fit, coping appraisal, and stress-related outcomes (satisfaction, stress, and fatigue).

Study 5 (n = 22) qualitatively explored contextual factors in the activity-based office that support or hinder privacy fit. Four factors were identified: the physical environment (e.g. variety of settings) and the social environment (e.g. social norms), the job (e.g. role conflict), and the self (e.g. self-awareness).

This thesis developed a new measure of work privacy and confirmed that privacy fit has an impact on workers' well-being. The thesis demonstrated the methodological benefit of considering individuals' appraisal, and the importance of contextual factors in privacy regulation.

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Publications Arising from the Thesis

Conference Papers

Weber, C., Gatersleben, B., & Uzzell, D. (2016, June). *Privacy appraisal in open-plan offices*. Oral presentation at 24th International Association for People-Environment Studies (IAPS) Conference, Lund, Sweden.

Weber, C., Gatersleben, B., & Uzzell, D. (2017, May). *The Privacy Appraisal Model*. Oral presentation at European Association of Work and Organizational Psychology (EAWOP) Conference, University College Dublin, Ireland.

Weber, C., Gatersleben, B., & Uzzell, D. (2017, August). *Privacy appraisal in open-plan office*. Oral presentation at International Conference of Environmental Psychology (ICEP), A Coruña, Spain.

Weber, C., Gatersleben, B., & Uzzell, D. (2018, March). *Why privacy impairment leads to stress & fatigue at work and what we can do about it*. Oral presentation at Workplace Trends Conference, Research Summit, London, United Kingdom.

Weber, C., Gatersleben, B., & Uzzell, D. (2018, July a). *The Privacy Appraisal Model*. Oral presentation at 25th International Association for People-Environment Studies (IAPS) Conference, Rome, Italy.

Weber, C., Gatersleben, B., & Uzzell, D. (2018, July b). *The meaning and measurement of privacy at work – Development and evaluation of the Privacy at Work Inventory (PAW)*. Oral presentation at 25th International Association for People-Environment Studies (IAPS) Conference, Rome, Italy.

Weber, C., Gatersleben, B., & Uzzell, D. (2018, October). *Why privacy impairment leads to stress & fatigue at work and what we can do about it*. Oral presentation at IFM Research Symposium, Zürich, Switzerland.

1 Chapter One:

Privacy – Conceptualisations & Perspectives

1.1 Introduction to the Thesis

1.1.1 Why Study Privacy in Open-Plan Offices?

Open-plan office configuration is a worldwide trend and in Europe, the predominant form of office configuration (Mravec & Stegmeier, 2017). In the last few decades, office layout has transitioned from cellular spatial configurations to open-plan, often with shared workplaces (Mravec & Stegmeier, 2017; Vos & van der Voordt, 2002).[1] Changes that offset modifications in office configurations have developed alongside trends in the society and the world of work, such as the introduction of information and communication technology and increased flexibility in organising work processes (Vos & van der Voordt, 2002; cf. Danielsson, 2010). Besides the economic benefits of open-plan offices, such as increased net usable area, higher occupant density, reduction of service costs, and flexibility of office use, open-plan configuration also supports a shift in the management strategy of process organisation (e.g. Duffy, 1992; Flynn, 2014; Hedge, 1982). This shift is characterised by the idea that collaboration is the engine for progress and innovation (Flynn, 2014; Kupritz, 2000) and therefore management and office strategies have placed their focus on facilitating teamwork. The absence of internal physical barriers is thought to facilitate task flow and communication between individuals and teams, and across departments, which consequently is presumed to improve morale and performance (e.g. Boje, 1971; Brand & Smith, 2005; Kupritz, 2003).[2] However, for decades social scientists have argued that increasing

[1] There is no agreed typology on the social density constituting an open-plan office. Danielsson (2010), a researcher based in Sweden, suggested a categorisation of densities for small (4–9 persons/room), medium-sized (10–24 persons/room), and large open-plan (> 25 persons/room) offices. However, this technical definition for space standards is likely to differ across countries, as do other space standards for office buildings.

[2] One of the arguments for the believed success of the strategy is the social facilitation hypothesis, which states that the performance of routine tasks will improve in areas that provide social stimulation (Geen & Gange, 1977).

collaboration at all costs can be counterproductive and can bear the risk of reducing not only individuals' performance but also team efficiencies (e.g. Sundstrom, 1978; Sundstrom, Burt, & Kamp, 1980). As Flynn (2014, p. 33) put it, "while togetherness at work is vital for value creation, in excess it is a killer." In fact, a large body of environment and behaviour literature documents the mismatch between the need for distraction-free work and the reality that most people face in open-plan offices (Brill, Keable, & Fabiniak, 2000) – a pitfall of organisations when alterations are designed to increase collaboration without considering workers' needs.

An extensive research literature on workplaces consistently identifies a lack of privacy as the key source of dissatisfaction among open-plan workers (e.g. Danielsson & Bodin, 2009; de Croon, Sluiter, Kuijer, & Frings-Dresen, 2005; Hedge, 1982). Some scholars even declare that privacy issues are more impactful on workers than physical comfort factors such as temperature, light, or ventilation (e.g. Farrenkopf & Roth, 1980). However, research on work privacy has significant conceptual and methodological limitations, including unclear conceptualisations of privacy at work, incoherence in the operationalisation of work privacy in empirical research, and psychometrically weak measures.

Further, although previous research has identified privacy as a primary concern of open-plan office workers, little is known about the types of consequences a lack of privacy can result in. Some accounts point to psychological costs that are related to frequent exposure to socio-environmental stress (e.g. Goodrich, 1986). Equally, the reason for these detrimental consequences occurring is greatly understudied. This limits the understanding on how to prevent the undue impact of privacy impairment. Lazarus and Cohen (1977) postulate that current research would greatly benefit from exploring socio-environmental stressors, such as a lack of privacy, from a transactional stress appraisal perspective. This approach appears to be an avenue for exploring why acute privacy-related stress occurs and could explain the occurrence of severe psychological costs when privacy-related stress is endured frequently. Consequently, it could inform solutions to prevent this cascade from developing.

Moreover, a large body of research on privacy in open-plan offices was conducted in the 70s, 80s, and 90s and focused on old versions of open-plan offices. Hence, the understanding of social and environmental context factors that could support or hinder privacy regulation relates to versions of open-plan offices that fell out of fashion. Open-plan office concepts have evolved into more flexible office concepts, e.g. activity-based working (ABW). An ABW environment places reduced focus on the individual desk and offers a landscape of work settings that are meant to support various tasks at work (from highly concentrated to highly collaborative tasks) and ought to be used whenever the worker desires (e.g. Engelen et al., 2018). Due to their highly flexible nature, ABW environments have the potential to be conducive to privacy regulation and could prevent privacy-related consequences. However, research on privacy in ABW environments is limited and the little research that exists has similar limitations to prior works.

1.1.2 Aims of the Thesis

The aims of the thesis were therefore to:

- Develop a psychometrically tested, quantitative measure of work privacy
- Assess the relationship between privacy fit, coping appraisal, and stress-related consequences at work (satisfaction, stress, fatigue)
- Assess the relationship between contextual workplace factors typically found in ABW environments and both privacy fit and coping appraisal
- Explore contextual factors in ABW environments that support or hinder privacy regulation

1.1.3 Epistemological Reflection

The epistemological stance taken throughout this thesis is most closely aligned to critical realism (see Maxwell, 2012 for review). Following Phillips (1987, p. 205), the author believes in realist ontologies as she shares his view "that theories refer to real features of the world" and "that entities exist independently of being perceived, or independently of theories about them". However, at the same time, the author is accepting a form of epistemological constructivism as she believes in the limitations to objectivity; a core belief shared among critical realists of different schools (Maxwell, 2012). The author recognizes that our perceptions and interpretation of the world is a construction from our surroundings and experiences, which has to be taken into consideration when conducting and reviewing research. Oppose to a scientific objectivism stance that claims the existence of only one correct truth about reality, the critical realism stance taken in this thesis acknowledges that there is more than one correct way of considering reality (Lakoff, 1987 in Maxwell, 2012).

1.1.4 Structure of the Thesis

To address the aims of this thesis, three theoretical chapters (Chapters 1–3) will be presented followed by five empirical chapters (Chapters 4–8). Chapter 1 sets the scene by outlining limitations and inconsistencies of general and work privacy definitions and concludes with a proposed definition of work privacy. In addition, the argument is developed that the addition of the variable coping appraisal to an established model of privacy is beneficial for the investigation of consequences of poor work privacy. Chapter 2 has two parts. Firstly, it gives an overview on the evidence of consequences of poor work privacy. The argument is developed that the investigation of the relationship between privacy and stress-related consequences at work (satisfaction, stress, and fatigue) is necessary. Secondly, it gives an overview on the evidence of contextual factors that support privacy at work, describes particularities of the ABW concept, and argues how a variety of work settings, protocols, and

location autonomy could support privacy fit and coping appraisal at work. Chapter 3 reviews existing measures of work privacy and argues the need for a new multidimensional measure of work privacy.

The subsequent five chapters, Chapters 4 to 8, present the empirical work conducted for the thesis. Chapter 4 presents Study 1, which is a qualitative study that explores poor privacy fit scenarios. Study 1 presents the developmental stage of the new work privacy measure. Chapter 5 presents Studies 2.A and 2.B, which test the psychometric properties of the new work privacy measure. Chapter 6 presents Study 3, which uses the new measure and assesses the relationships between privacy fit and consequences (satisfaction, stress, and fatigue), contextual factors, and the role of coping appraisal in these relationships cross-sectionally. Chapter 7 presents Study 4, which assesses the previously tested relationships longitudinally with two measurement points before and after a move from a traditional open-plan office to an ABW office. Study 4 explores whether changes in contextual variables lead to changes in privacy fit, coping appraisal, and consequences (satisfaction, stress, and fatigue). Chapter 8 presents Study 5, which is a qualitative study that explores workers' differences in managing privacy in the new ABW open-plan office to which they had recently moved. The focus of analysis is on differences in strategies and available resources. Chapter 9 concludes the thesis with a final discussion.

1.2 Chapter Introduction

Chapter 1 gives an overview on the prevalent conceptualisations and perspectives of general privacy and work privacy. This is presented in two parts.

Firstly, the theory base of general privacy is described. This first part of the chapter will start with an overview on prevalent conceptualisations of general privacy. Subsequently, Altman's definition of general privacy (e.g. 1975) will be presented, followed by a description of his privacy framework, and his model of privacy regulation. Points of critique on Altman's

privacy regulation model will be made, which will form the basis for the subsequently proposed adjustment of the model for this thesis.

Secondly, the theory base of work privacy is described. This second part of the chapter will start with an overview on the variety of perspectives on work privacy. This overview is followed by a detailed critique of three prevalent conceptualisations of work privacy from different fields of research. This will form the basis for the subsequent proposal of a new definition of work privacy based on Altman's theory.

1.3 Conceptualisations of General Privacy

1.3.1 Overview

Theoretical perspectives on privacy vary greatly and, as pointed out by Newell (1995), no agreement has been reached on what privacy constitutes. Most definitions of privacy describe an interactional condition between the person and the socio-physical environment but have different foci. Either the focus is on the person (e.g. when privacy is seen as a condition of a person or a state of being; e.g. Bailey, 1979; Fischer, 1971; Schoeman, 1984), on the environment (e.g. when privacy is defined as quality of space, e.g. Webster, 1979 in Altman, 1975; when privacy is an attitude toward the environment, e.g. Pedersen, 1979, 1999; Westin, 1970), or on the person-environment interaction (e.g. when privacy is concerned with a transactional person-environment regulation process; Altman, 1975; Margulis, 1977). Privacy can also be solely seen as a need (Milgram, 1970) or conceptualised and researched in the context of being a legal right (Gavison, 1984).[3]

In spite of the variety of definitions, two central themes emerge. The first theme is a form of input control: it is the personal control of input from persons and stimuli outside the self (including access to the self; e.g. Altman, 1975; Bates, 1964; Beardsley, 1971; Ittelson,

[3] For further detail, see, for example, Bates (1964), Westin (1970), Margulis (1977), Altman (1975), Kupritz (2000), and/or Newell (1995) for reviews.

Proshansky, & Rivlin, 1970; Marshall, 1972; Sundstrom, 1986). The second theme is a form of output control over personal information of varying degrees (Beardsley, 1971; Greenawalt, 1971; Justa & Golan, 1977; Kelvin, 1973; Margulis, 1977; Shils, 1966; Westin, 1970). Social withdrawal and seclusion are regularly mentioned across definitions as well (e.g. Bates, 1964; Chapin, 1951; Jourard, 1966; Pedersen, 1979, 1999; Westin, 1970). However, it is argued that social withdrawal is a boundary regulating behaviour and seclusion a mechanism to gain minimum input and output. Some scholars see a third theme emerging from the various conceptualisations, which is regulation of interaction (e.g. Kupritz, 1998, 2000; Le Poire, Burgoon, & Parrott, 1992). However, others argue that interaction regulation is a meta-theme in which input control of access and stimuli and output control of information are nested (e.g. Altman, 1975).

The argument of interaction regulation being a meta-theme matches Altman's privacy regulation framework (1975, 1976, 1977). His framework, which is grounded in the field of psychology, has been referred to as the most comprehensive (Le Poire et al., 1992) and widely accepted framework of privacy (e.g.Kupritz, 1998, 2000; Sundstrom, 1986). It has also been referred to as useful for studying privacy in the organisational context (Kupritz, 1998, 2000; Le Poire et al., 1992). Altman's framework will form the basis of the research in this thesis.

1.3.2 Altman's Privacy Definition, Framework & Model

1.3.2.1 Altman's Privacy Definition

Altman (1975) defines privacy as "a central regulatory process by which a person (or group) makes himself more or less accessible and open to others … A central notion … is "interpersonal boundary regulation" … [which] refers to a person or group maintaining an appropriate and desired level of interaction between itself and the external physical and social environment" (p. 3). This definition contains several properties that are central to his approach. It permits the analysis of privacy as a bidirectional process – that is, input from

others to the self and output from the self to others. Further, the definition implies selective control, or an active and dynamic process, in which privacy can change over time and with different circumstances. He specifies different personal, interpersonal, and contextual factors that influence desires for privacy and privacy regulating behaviour.

1.3.2.2 Altman's Privacy Framework

Altman's framework has six specifications in regard to privacy that are unique to his theory:

(1) He differentiates between a person's desired level of privacy and a person's achieved (or actual) level of privacy.

(2) How well desired and achieved privacy match is described by their level congruency or fit. This fit perspective is congruent with person-environment (P-E) fit theory (Caplan, 1983, 1987a,b; Caplan & Harrison, 1993; Edwards, Caplan, & Harrison, 1998; French, Caplan, & Harrison, 1982; French, Rodgers, & Cobb, 1974; Harrison, 1978, 1985). It is proposed that person-environment (P-E) fit theory is a meta-theory to Altman's privacy theory as it corresponds with its principles. P-E fit is defined as the degree to which individual characteristics (i.e. psychological needs) and environmental characteristics (i.e. job demands, cultural values, physical environment, and social environment) match (Edwards, 2008).

(3) Altman theorises cases of having too much privacy (if achieved privacy > desired privacy) and cases of having too little privacy (if achieved privacy < desired privacy).

(4) In line with his definition, he further compartmentalises desired and achieved privacy into levels of input and output that people desire or can achieve.

(5) He defines privacy regulation as an optimisation process as people attempt to achieve the optimal fit between desired and actual privacy at any moment in time. An unsuccessful privacy regulation system ought to lead to the experience of stress.

(6) He suggests that privacy needs are dynamic as they change throughout the course of the day influenced by personal (e.g. mood), interpersonal (e.g. closeness to others), and situational (e.g. work task) factors.

1.3.2.3 Altman's Privacy Model

In his model, a desire for privacy motivates the use of boundary-regulating behaviours to achieve the level of privacy that is desired. The use of boundary-regulating behaviours is followed by a stage that he called "assessment of effectiveness of boundary control processes" (p. 156). In a successful privacy regulation system, the achieved outcome is appraised to match the desire. If not, stress is experienced, which is thought to motivate further coping behaviour. Altman constructed four different cases of poor privacy fit (the mismatch between desired and achieved privacy). Two of the cases fall into the category of having too much privacy (being isolated) and two cases fall into the category of having too little privacy (being intruded upon). The cases of having too little privacy are of interest to this thesis, because a lack of privacy has been reported as being problematic for office workers (e.g. Danielsson & Bodin, 2009; de Croon et al., 2005; Hedge, 1982). One of the cases of having too little privacy describes a situation in which there is more input from others than desired. The other case describes a situation in which there is more output to others than desired.

1.3.3 Critique on Altman's Model

Altman's model presents some inconsistencies. Firstly, appraisal is used inconsistently in his model, as a second appraisal stage seems to be missing. He states that desired levels of privacy motivate boundary-regulating behaviour. However, before boundary-regulating behaviours are used, the individual has to appraise a discrepancy between the desired and the actual level of privacy; otherwise, the need to employ coping behaviour would not be apparent. Currently, the model specifies only one stage in which privacy fit is appraised, which is *after* boundary-regulating behaviours have been used.

Secondly, negative affect such as stress is used inconsistently in his model, as a second "stress" stage seems to be missing. He states that desired levels of privacy motivate boundary-regulating behaviour (Altman, 1975). However, in line with cognitive appraisal research, negative affect such as stress precedes and motivates any coping behaviour (e.g. Folkman & Lazarus, 1985), such as boundary-regulation. Negative affect in turn is preceded by appraisal (e.g. Folkman & Lazarus, 1985). Currently, the model specifies only one stage in which appraisal leads to stress and stress in turn motivates coping behaviour.

Thirdly, the emphasis on individual factors is inconsistent, as appraisal focuses on the individual's cognition and sense making of the environmental surrounding. Altman (1975) states that appraisal is concerned with the fit of desired vs actual privacy. The outcome of the appraisal stage should define the resulting quality of emotions. This is similar (but not identical) to the primary appraisal stage in cognitive appraisal theory (cf. Lazarus, 1966, 1991, 2006; Lazarus & Folkman, 1985; Lazarus & Launier, 1978). Cognitive appraisal theory identifies a second appraisal stage, called "secondary appraisal" or "resource appraisal". Appraisal theory suggests that a range of negative emotions at work are fundamentally controlled by appraisal processes, and that cognition is crucial in determining whether environments or relationships at work are experienced as stressful (Todd, Weidner, & Janisse, 2012). Therefore, Altman's model arguably resides in the theoretical grounding of person-environment fit theory (Edwards et al., 1998) but includes elements of cognitive appraisal theory (Folkman & Lazarus, 1985).

1.3.4 Suggested Addition to Altman's Model: Coping Appraisal

Based on the aforementioned inconsistencies in Altman's model, an extension to the model with the second appraisal variable, coping appraisal (e.g. Folkman & Lazarus, 1985), is proposed. According to cognitive appraisal theory, appraisal of a person-environment encounter has two parts, primary appraisal and secondary appraisal (e.g. Folkman & Lazarus,

1985). Together, both appraisal stages determine the experienced emotions associated with the person-environment encounter. The first appraisal stage is an assessment of the environmental demand (e.g. relevant, benign-positive, challenging, threatening, or harmful). This is not identical but similar to Altman's appraisal of fit between desired and achieved privacy. The second appraisal stage, coping appraisal, is the evaluation of one's perceived resources and coping options to handle the demand, or in this case handle poor privacy fit (e.g. it can be changed or has to be accepted). It involves a complex assessment of one's coping options (Folkman & Lazarus, 1985). The second stage of appraisal in cognitive appraisal theory has been termed "secondary appraisal" or "resource appraisal". Instead, this thesis refers to coping appraisal because of the association with the cognitive process that the term "coping appraisal" describes.[4] If both appraisal stages conclude negatively, negative affect is experienced (e.g. stress; e.g. Park & Folkman, 1997). Following this logic, poor privacy fit and poor coping appraisal result in feelings of stress whereas poor privacy fit and good coping appraisal do *not* result in feelings of stress. Following this logic, coping appraisal mediates the relationship between privacy fit and feelings of stress. Hence, the inclusion of coping appraisal in the model will help in exploring how poor privacy fit leads to stress and associated outcomes. The model used in this thesis builds on the first part of Altman's model, which describes the assessment of privacy fit and adds coping appraisal to explore the relationships between work privacy, stress-related consequences, and contextual factors at work.

A study on privacy regulation in dormitories by Vinsel, Brown, Altman, and Foss (1980) highlights how the inclusion of personal appraisal could explain some of the variance

[4] Other research fields in the social sciences, e.g. fear appraisal research, have referred to coping appraisal as well. Whereas their conceptualisations of coping appraisal tend to be related Folkman and Lazarus's (1985) secondary appraisal concept, their definition and operationalisation of coping appraisal was adapted to their focus of research. Hence, they tend to differ from the understanding of coping appraisal or secondary appraisal as used in this thesis. For example, fear appraisal research defines coping appraisal as "beliefs about the effectiveness and feasibility of recommended action in averting threat" (Ruiter et al., 2003, p. 466).

in the results to privacy-related dissatisfaction in the sample. The authors suggest that the difference in privacy-related satisfaction can be explained by differences in the perceived efficacy of privacy regulating behaviour, such as avoidance techniques. Satisfied students were also assumed to have more "quickly adjusted to the demands of university life and seemed to handle their day-to-day social relationships quite well" (p. 1114). As satisfaction is an affect-based construct, a cognitive-affect-based theory, such as cognitive appraisal, lends itself to explaining differences in satisfaction. Hence, individual differences in privacy-related coping appraisal could explain differences in privacy-related satisfaction in the sample.

1.4 Conceptualisations of Work Privacy

1.4.1 Overview

Overall, perspectives and conceptualisations of work privacy vary greatly in their depth and conceptual rigour. As pointed out by Goodrich (1982), office literature tends to present a dichotomy between *spatial privacy* and *perceived privacy*. The former is described in physical terms as "solid walls, sound-absorbing partitions, masking sound, and physical separation" (p. 121). The latter is "more complex and influenced by more than spatial parameters" (p. 121). The following review considers concepts of perceived privacy only as these are central to the transactional models of privacy and appraisal used in this thesis. Further, the review will not include separate conceptualisations of desire for privacy, as this is not the object of research and falls beyond the scope of this thesis.

Most definitions of work privacy correspond to general definitions of privacy and treat it as a multidimensional construct. However, they uniformly draw on a limited number of dimensions or types of privacy and do not tend to be developed along a conceptual framework and are therefore not always consistent. Most of the time, the types of work privacy specified are *speech privacy* (or conversational privacy) and *visual privacy* (Sundstrom, 1986). *Speech privacy* refers to having conversations at work without others overhearing (e.g. Cavanaugh,

Farrell, & Hirtle, 1962). Sometimes, this includes the ability to have conversations without disturbing others (Oldham, 1988; Sundstrom, 1986). Sometimes, scholars refer to *acoustical privacy* instead, which refers to the ability to have conversations that are not overheard and isolation from intruding sounds (e.g. Zagreus, Huizenga, Arens, & Lehrer, 2004). *Visual privacy* (sometimes also called *architectural privacy*; Rashid & Zimring, 2008) refers to surveillance (Kim & de Dear, 2013; Sundstrom, 1986). Occasionally, it also includes isolation from visual distractions (others working or passing nearby; e.g. Zalesny & Farace, 1987). Interruptions by colleagues are only rarely acknowledged. When they are, they are incorporated into *task privacy* (general distractions and interruptions; e.g. Oldham, 1988).

1.4.2 Other Conceptualisations of Work Privacy Based on Altman – A Critique

In the following section, three prevalent conceptualisations of work privacy that build on Altman's work are discussed. These come from different fields of research (psychology, anthropology, and communication research). These three have been selected on the basis of their prevalence in their field and their comprehensiveness. Each of the scholars reflects on Altman's work and provides alternative ideas to privacy, corresponding to their field of research. The following discussion aims to examine their reflections on Altman's concept of privacy to support the rationale for using it as the basis of the thesis.

1.4.2.1 Sundstrom's Conceptualisation of Work Privacy

The conceptualisation by Sundstrom (1986) is grounded in psychology, as is Altman's framework. Although Sundstrom (1986), pointing to one of his previous studies (Sundstrom, Town, Brown, Forman, & McGee, 1982a), draws on Altman's (1975) concept of general privacy and highlights its multidimensional and transactional nature, he concludes with a reductionist definition: "(work) privacy is defined as the ability of individuals or groups to satisfactorily regulate their accessibility to others" (p. 178). This definition is unidimensional and reduces work privacy to control over co-workers accessing oneself. It puts a reductionist

view on input control and excludes output controls (e.g. panoptic effects, information control). In his later works (e.g. Sundstrom, Herbert, & Brown, 1982b), he does not explicitly rephrase the definition but explains that work privacy generally reflects the regulation of interaction, which encompasses both retreat and information management (Sundstrom, 1986). In comparison to Sundstrom's previous definition (Sundstrom et al., 1982a), this new explanation is more aligned with Altman's understanding of privacy. However, Sundstrom (1986) kept his explanations brief. Hence, it is unclear where his conceptualisation matches that of Altman. Furthermore, Sundstrom (1986), pointing to the results of Sundstrom et al. (1982b), suggests the weighting of privacy types. The primary type would be "regulation of social contact", the secondary type would be "avoidance of distraction, interruption, and noise" (p. 191), and the tertiary type would be "autonomy and conversational privacy". However, it is unclear why these types are weighted and, in addition, there is no empirical evidence to support the types' relative weight. Further, he presents environmental factors and job characteristics that correlate differently with these privacy types, but his explanations are unclear as to whether the weighting is stable or determined by these contextual factors (if, for example, the tertiary type would be most important to managers). Overall, he presents an unclear conceptualisation of work privacy across his works. Therefore, it is concluded that Sundstrom's conceptualisation of work privacy does not lend itself to this thesis.

1.4.2.2 Burgoon's Conceptualisation of Work Privacy

The conceptualisation by Burgoon (1982) is grounded in the field of communication research. Burgoon (1982) draws on Altman's concept and emphasizes its applicability to the investigation of communication research. It is stated that Altman's concept would allow the analysis of different social units (ranging from organisation to individual). Further, his concept would emphasise the active nature of the privacy regulation process, which in turn would underline the role of communication during privacy regulation. Burgoon points out that

Altman put an emphasis on the variability of perceived privacy invasion (due to individual differences in needs). In contrast, her theory, which builds on Altman, has put the variability of social relationships in focus to explore the role of communication within privacy invasion: "what is considered invasive depends upon the type of relationship in which the invasion occurs" (p. 422). Therefore, it is not a surprise that the proposed definition emphasizes social relationships and the content of social exchanges. Burgoon (1982) postulates that privacy is made up of four types of privacy that can be invaded: (1) physical, (2) social, (3) psychological, and (4) informational. Physical privacy is defined as "freedom from surveillance and unwanted intrusions upon one's space" (Burgoon, 1982, p. 422). Social privacy is defined as control over "the who, what, when, and where of encounters with others so as to achieve a manageable number of social relationships". Psychological privacy is defined as protection "from intrusions upon one's thoughts, feelings, attitudes, and values", and informational privacy as "the ability to control who gathers and disseminates information about one's self or group".

In comparison to psychological concepts of privacy, Burgoon's four privacy types were specifically constructed to aid communication research. Although Burgoon's privacy types include elements of previously mentioned types or cases of privacy (e.g. Altman, 1975), such as output control (information and surveillance) and input control (social interaction and stimuli), they do not fully constitute types of privacy when compared to psychological concepts. For example, both (1) the physical privacy type and (2) the social privacy type are tautological in their construction as privacy is a socio-environmental phenomenon and therefore arguably requires a spatial and a social element. Further, (3) the psychological and (4) the informational privacy type are both concerned with different contents of information that require regulation, which does not necessarily justify two separate dimensions. In addition, (2) the social and (4) the informational privacy type both focus on "who" seeks

contact or disseminates information. However, interpersonal relationships (the "who") is a contextual factor that correlates with privacy desires and with privacy regulating behaviour (Altman, 1975). It does not constitute a type of privacy on its own. Hence, Burgoon's concept does not appear to be clear in structuring types of privacy and correlates (such as quality of social relationships). Overall, Burgoon does not seem to have followed Altman's privacy framework consistently as types of privacy and contextual factors impacting on privacy (such as quality of social relationships) are not clearly separated, types are overlapping, and do not clearly differentiate between input and output controls as suggested by Altman. Therefore, it is concluded that Burgoon's definition does not lend itself to this thesis, which investigates, amongst other things, the impact of different contextual factors on privacy fit.

1.4.2.3 Kupritz's Conceptualisation of Work Privacy

The conceptualisation by Kupritz (1998, 2000) is grounded in anthropology, environmental psychology, and communication research. Kupritz developed a definition and an environmental privacy theory (EPT) that incorporate a systems perspective to privacy. She defines "privacy as a psychosocial state associated with the regulation of interaction between the self and others and/or environmental stimuli (i.e. visual, auditory, tactile, and olfactory) (Kupritz, 1998, 2000; Kupritz & Haworth, 2005). Regulating disclosure boundaries is recognised in this definition (Kupritz, 2011). She states that the aim was to expand Altman's definition (Kupritz, 2000). She criticises the fact that the central theme in Altman's framework is regulation of interaction, neglecting (although incorporating) other themes such as "information control" or "retreat from others" (2011, p. 294). However, it seems that this is a misconstruction of Altman's theory as privacy regulation is a meta-theme in his framework with output and input controls acting as subthemes. Altman specifically states that output controls include control over information (Altman, 1975) whereas input controls include "stimuli coming from others to the self – from the outside in" (Altman, 1975, p. 27). Further,

it is postulated that "retreat from others" or "solitude" is a solution or a means to an end (gaining maximum control over input and output) and not a type of privacy. Furthermore, her definition is referring to general environmental stimuli whereas privacy is a socio-environmental construct; the definition seems to require a specification of "socio-environmental" stimuli. Therefore, Altman's definition seems sufficient and does not seem to require an extension.

Further, the EPT is meant to extend Altman's framework (1975) with regulatory characteristics of privacy in a workplace system. Within the EPT, it is postulated that environmental, behavioural, and social mechanisms regulate privacy in the workplace, and operate in different combinations in a cultural context. She specifies: "[T]hat is, not only do institutional practices and design, along with individual and group behaviour, facilitate and impede privacy, but individuals and groups bring to their work environment the deeper values and assumptions they share about privacy, which are conditioned by their larger societal cultures" (p. 296). However, these postulations have been made by Altman as well. In his monograph "the Environment and Social Behaviour" (1975) he explains how personal, social, and environmental characteristics rooted in a cultural context determine one's needs for privacy as well as one's behavioural options to regulate. Therefore, the EPT does not necessarily extend Altman's thinking but transfers it to the work environment. Although later works by Kupritz (2011) investigate correlates of privacy needs and job profiles, to date, the EPT does not specifically include personal characteristics as Altman's conceptualisation does (e.g. personality, past history, or momentary psychological and physical state; see Altman, 1975). Based on this critique, it is concluded that Kupritz's conceptualisation is not more suitable than Altman's conceptualisation for the investigation of this thesis.

1.4.3 Suggested Definition Based on Altman

The review of work privacy conceptualisations indicated that Kupritz's (2000) concept of multidimensional work privacy is closest to Altman's (1975) coherent framework. However, it became clear that Altman's framework is superior in its coherence. In this thesis, therefore, Altman's understanding of privacy is used. Hence, the following definition of work privacy is used in this thesis: *Work privacy is a control process of input and output of information in the work environment*. Workers attempt to regulate contacts and stimuli coming from their colleagues and output they make to their colleagues. They strive to achieve the best possible fit between their actual and desired levels of input and output at work. The definition describes the selective control of access to oneself; it understands privacy as a bidirectional process – including inputs from others to the self and outputs from the self to others; and it includes selective control or an active dynamic process in which privacy can change over time and with different circumstances.

1.5 Chapter Conclusions

This chapter has given an overview on prevalent conceptualisations and perspectives on general privacy and work privacy. It highlighted great variation in depth and conceptual rigour. This chapter has also reviewed Altman's (1975) definition, framework, and model of privacy regulation. The chapter proposed an addition to the model to gain a deeper understanding of the relationships between work privacy, its work-related consequences, and contextual work factors. The review of other work privacy concepts pointed out that none is as coherent as Altman's (1975) conceptualisation of privacy regulation. Therefore, this thesis will employ his understanding of privacy and will transfer it to the context of work environments.

As one of the aims of this thesis is to assess the relationship between privacy fit, coping appraisal, and stress-related consequences at work, the following chapter will review

empirical evidence on the consequences of poor privacy fit. Another aim of this thesis is to investigate contextual factors that can improve privacy fit and privacy-related coping appraisal to inform the prevention of poor privacy fit and its undue consequences. Accordingly, evidence on privacy-associated contextual factors in different types of offices, including ABW environments, will be reviewed in the following chapter.

2 Chapter Two:

Consequences & Contextual Factors Associated with Work Privacy

2.1 Chapter Introduction

Chapter 2 gives an overview on empirical evidence on the consequences of poor work privacy and on contextual factors that are associated with work privacy. This is presented in two parts.

Firstly, the empirical evidence on the consequences of poor work privacy is presented. This first part of the chapter will start with an overview on impacts of unsuccessful input control, followed by evidence on impacts of unsuccessful output control. Subsequently, arguments will be made to investigate the relationship between poor privacy fit, coping appraisal, and the outcomes satisfaction, stress, and fatigue.

Secondly, the empirical evidence on contextual factors that are associated with work privacy is presented. This second part of the chapter will start with a terminological clarification. Then, evidence on the relationships between contextual factors and privacy fit will be presented by referring to an established model of privacy regulating mechanisms at work. Subsequently, the activity-based working (ABW) environment will be briefly defined and afterwards privacy-related evidence on ABW environments will be presented. Following that, arguments will be made to investigate the relationships between poor privacy fit, coping appraisal, and the contextual factors work settings, protocols, and location autonomy, which are typically part of ABW offices.

2.2 Consequences of Poor Work Privacy

2.2.1 Existing Evidence

Empirical evidence on the multidimensional impact of poor work privacy is scarce. Most of the evidence is concerned with the impact of unsuccessful input control such as noise, visual distractions, or disruptions and has not necessarily been collected in the context of

privacy research. Work process-related consequences of unsuccessful input control include hindrance to work on complex tasks as train of thought requires constant reconstruction (e.g. Goodrich, 1986; Wallis, Steptoe, & Cole, 2006), concentration difficulties (e.g. cf. Haynes, 2007; Hedge, 1982; Veitch, Bradley, Legault, Norcross, & Svec, 2002), reduction in attention, increased work task errors (e.g. Goodrich, 1986; Kupritz, 1998), increased difficulty in decision-making (Hedge, 1982), and a general reduction in performance (e.g. Banbury & Berry, 1997, 1998; Brill, Margulis, Konar, & BOSTI, 1984; Kupritz, 1998; Wallis et al., 2006).

Affect-related consequences include anxiety about being unable to complete work as a result of the distractions (e.g. Goodrich, 1986), feeling of powerlessness (Goodrich, 1986), feeling invaded (e.g. Goodrich, 1986), annoyance with colleagues (Goodrich, 1986), task motivational deficits (Evans & Stecker, 2004), general negative affect (Zijlstra, Roe, Leonora, & Krediet, 1999), increased job stress (Goodrich, 1986; Raffaello & Maas, 2002), and other forms of negative affect (Klitzman & Stellman, 1989). Health-related reactions to frequent noise disruptions and general distractions include forms of fatigue or burnout (Goodrich, 1986; Klitzman & Stellman, 1989; Laurence, Fried, & Slowik, 2013).

There is some evidence on the impact of unsuccessful output control such as surveillance-related aspects or keeping conversations and work content confidential. Evidence relates to affect-related consequences such as feelings of exposure, feelings of vulnerability, and feelings of stress (Goodrich, 1986) or reduced workplace satisfaction (e.g. Klitzman & Stellman, 1989; McCarrey, Peterson, Edwards, & Von Kulmiz, 1974; Oldham, 1988). A study by Laurence et al. (2013) employing Oldham's scale, which includes inputs (task privacy) and outputs (communication privacy), found an effect on emotional fatigue. However, as aggregated scores of the privacy scale were used, it is not clear how much the effect was accounted for by output control.

2.2.2 Investigating Impacts on Satisfaction, Stress, & Fatigue

The following sections will develop the argument for investigating the relationship between poor work privacy, coping appraisal, and the outcomes satisfaction, stress, and fatigue. In order to do so, the theories of person-environment fit (Caplan, 1983, 1987a,b; Caplan & Harrison, 1993; Edwards et al., 1998; French et al., 1982; French et al., 1974; Harrison, 1978, 1985) and cognitive appraisal (cf. Lazarus, 1966, 1991, 2006; Lazarus & Folkman, 1985; Lazarus & Launier, 1978) will be drawn on. While it is acknowledged that satisfaction, stress, and fatigue at work are related (Furnham & Schaeffer, 1984) interactions between these outcome variables are not part of the present research. The subsequent sections will present arguments for each outcome variable.

2.2.2.1 Privacy, Coping Appraisal, & Job and Workplace Satisfaction

Job satisfaction assesses workers' contentedness with their job as a whole and has been defined as "a pleasurable or positive emotional state resulting from the appraisal of one's job or job experiences" (Locke, 1976, p. 1304). Job satisfaction can be measured cognitively, affectively, and behaviourally (Hulin & Judge, 2003). Workplace satisfaction assesses workers' contentedness with their physical work environment (Sundstrom, 1986).

There is ample empirical evidence associating privacy with job and workplace satisfaction. This finding is consistent across studies using different operationalisations of privacy, e.g. acoustical and visual privacy (e.g. Kim & de Dear, 2013; Klitzman & Stellman, 1989; Stokols & Scharf, 1990; Zalesny & Farace, 1987), general privacy (Sundstrom, 1986), speech privacy and task privacy (Oldham, 1988), general privacy, speech privacy, and interruptions (e.g. Sundstrom, 1986), acoustical privacy, interruptions, and visual privacy (Veitch, Charles, Farley, & Newsham, 2007), and general privacy, speech privacy, and visual privacy (O'Neill & Carayon, 1993).

By referring to findings of substudies (Sundstrom et al., 1980; Sundstrom et al., 1982a; Sundstrom et al., 1982b) in which privacy was found to correlate with job and workplace satisfaction, Sundstrom (1986) explains that both unsuccessful input and output control can contribute to dissatisfaction at work. With regard to input controls, he and other scholars suggest that frequent disturbances and interruptions hinder workflow and increase cognitive load, which creates additional demands for the worker resulting in dissatisfaction and other negative emotions (e.g. Brennan, Chugh, & Kline, 2002; Brill et al., 1984; cf. Haynes, 2007; Kim & de Dear, 2013; Kupritz, 1998; Sundstrom, 1986).

As regards output controls, Sundstrom (1986), in line with other scholars (e.g. Geen & Gange, 1977; Laurence et al., 2013), argues that feelings of being observed create high arousal, which creates additional demands for the worker resulting in reduced performance and dissatisfaction. It is plausible that the necessary divide in attention between work tasks and non-work aspects (feeling monitored, worrying about keeping things confidential) creates additional demands (cf. Cohen, 1980).

As this research is taking a P-E fit and cognitive appraisal approach, the following section explains the relationship between privacy and satisfaction in light of these theories. Occupational P-E fit research differentiates between two types of occupational fit: the fit between an individual's skills and abilities to match the requirement of the job and the extent to which the job environment provides the resources to meet the needs of the individual. A misfit of either can result in associated dissatisfaction and related negative emotions (cf. Furnham & Schaeffer, 1984; Ostroff & Judge, 2007). It is argued that P-E fit theory can be regarded as a meta-theory of Altman's privacy regulation theory. Hence, it is argued that if a job environment does not provide the resources to meet the privacy needs of the individual, it is likely to result in dissatisfaction with the physical environmental conditions. Sundstrom (1986) argues that "for privacy to contribute to job satisfaction, it is has to be relatively potent

in comparison with the many other factors that contribute to job satisfaction" (p. 181). However, if the work environment fosters a poor privacy fit (e.g. through the environmental conditions or the work culture), which in turn reduces one's capacity to work, dissatisfaction with the job overall seems likely.

Due to the fact that cognitive appraisal is traditionally a stress theory, appraisal research in work environments tends to be concerned mainly with appraisal of stressful work encounters (e.g. Dewe, 1991) rather than with beneficial work encounters (e.g. Babin & Boles, 1996). A potential rationale for the link between appraisal and satisfaction may be based upon the affective nature of job satisfaction. Environmental appraisals are the basis for emotional responses (Folkman & Lazarus, 1985). Since appraisals of poor privacy fit are interpreted as threatening, good privacy fit might produce congruent positive affect reactions such as satisfaction. In line with previous explanations on the proposed privacy model, it is argued that coping appraisal becomes salient if there is a poor fit between a person's desire for privacy and the actual socio-environmental conditions. If coping appraisal is negative, a negative emotional satisfaction response is likely. If coping appraisal is less negative or positive, an emotional satisfaction response is likely.

As previous studies have not operationalised privacy sufficiently, this thesis aims to validate the findings on workplace and job satisfaction with multidimensional operationalisation of work privacy. Further, this thesis aims to extend previous research by investigating whether coping appraisal mediates the relationship between poor work privacy (or privacy fit) and satisfaction.

2.2.2.2 Privacy, Coping Appraisal, & Stress

Conventional models of stress in psychology have defined stress in different terms. Either stress or stressors are understood as pressure or demands in the (work) environment (Dewe & Guest, 1990), for example "demands of a taxing job" (p. 136), or stress is seen as

"needs inside the individual which are blocked" (p. 136). One can also refer to distress, which is a consequential psychological and physiological (i.e. increased blood pressure and pulse) stress reaction (Ogden, 2012). There are also theories that relate particularly to environmental stress, such as the load theory (Cohen, 1978) or the arousal hypothesis (cf. Bell, Fisher, Baum, & Green, 1990; cf. Evans, 1979; cf. Sundstrom, 1986). These models understand stress as an element in a one-directional environment-person relationship, whereas cognitive theorists (i.e. cognitive appraisal theory by Folkman & Lazarus, 1985; the imbalance model by McGrath, 1970) have argued that the process is more complex (Dewe & Guest, 1990). In cognitive theories, such as appraisal theory (Folkman & Lazarus, 1985), stress is a transactional relationship "between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and as endangering his or her well-being" (Folkman, 1984, p. 840). In organisational research, the most prevalent theories of occupation stress include, amongst others, the occupational person-environment fit theory (Edwards & Cooper, 1990), the conservation of resources theory (Hobfoll, 1989; Shirom, 2011), and the job demands-resources model (e.g. Bakker & Demerouti, 2007). Some scholars have suggested the use of the latter for investigating environmental stressors at work (Laurence et al., 2013; Morrison & Macky, 2017), although the theory emphasises the role of work content as the major source of workplace stress.

As already pointed out, the present research takes a transactional approach to investigating privacy evaluations that is informed by P-E fit theory (in which Altman's privacy regulation theory is nested) and Lazarus's (Folkman & Lazarus, 1985) stress appraisal theory. This is justified by the fact that individuals show diverse responses to an identical environmental stimulus or environmental demand (Caplan et al., 1975). Hence, it is argued that for determining stress reactions an individual's appraisal of the environmental stressor (such as poor privacy fit) is more impactful than the actual state of the environment (Caplan et al., 1975; O'Neill & Carayon, 1993). In light of P-E fit theory, it is suggested that a poor fit

between workers' desires for privacy and the acute privacy levels determined by the socio-environmental conditions at work results in stress reactions. In addition, appraisal research states that the degree of a person's perception of being able to do something about the stressor (coping appraisal) partly determines the severity of the stress reaction. Appraisal theory positions coping appraisal as a gatekeeper to the quality of emotions experienced towards a potential stressor once an environmental demand (such as poor privacy fit) is appraised. Therefore, the present study will explore the role of coping appraisal in the relationship between poor privacy fit and feelings of stress.

There is ample empirical evidence on P-E fit at work and stress in the organisational stress literature (cf. Edwards & Cooper, 1990). Similarly, the appraisal approach has been used in organisational stress research. There is evidence on appraisal of stressful work experience related to the job and stress reactions (e.g. Dewe, 1991, 2003). However, research specifically concerned with appraisal of privacy fit and stress reactions is outstanding.

There is little empirical evidence on the relationship between privacy and stress. The little evidence available is mostly concerned with the relationship between stress and elements of privacy (either the impact of unsuccessful input or output controls), oppose to assessing the relationship between stress and the full multidimensional nature of privacy. Further, these accounts vary in their approaches to stress (clearly defined or loose, transactional or deterministic). Additionally, some results contradict each other. Empirical evidence on the impact of unsuccessful input controls on stress observed in a privacy context includes, for example, a study by Goodrich (1986). The qualitative accounts of his study suggest that work-related feelings of stress and anxiety result from frequent distractions that hinder task completion. However, a study by O'Neill and Carayon (1993) that investigated a link between general and speech privacy (input control) could not find a statistically significant relationship with distress (psychosomatic stress reactions). Yet, independently of privacy research, there is ample evidence on the relationship between unsuccessful input control such as noise and

psychosomatic stress (e.g. Brennan et al., 2002; Raffaello & Maas, 2002). Empirical evidence on the impact of unsuccessful output controls (such as surveillance) on stress observed in a privacy context is scarce as well. The study by O'Neill and Carayon (1993) observed a predictive link between distress (psychosomatic stress reactions) and perceptions of visual enclosure (example item: "other people can see into my workspace"). The latter can be regarded as a form of visual privacy, although it was treated as a variable distinct from privacy. Overall, previous studies' conceptualisations of privacy have considerable limitations and they vary in their conceptualisations of stress and rigour of assessment. Nonetheless, they offer suggestive evidence for a link between a multidimensional operationalisation of privacy fit and stress appraisal (Lazarus & Folkman, 1985). As the multidimensionality of privacy has so far been linked to stress only in theoretical works (e.g. Altman, 1975; cf. Johnson, 1974) and as present research has not specifically observed the link between privacy and stress appraisal, the present research aims to examine the transactional relationship between multidimensional operationalisation of work privacy (or privacy fit), coping appraisal, and stress.

2.2.2.3 Privacy, Coping Appraisal, & Emotional Fatigue

Emotional work fatigue is one of three dimensions of Frone and Tidwell's (2015) burnout framework that aims to offer a more coherent and differentiated approach to the concept of burnout. The two complementing work fatigue dimensions in Frone and Tidwell's framework are physical and mental work fatigue. General work fatigue is a fundamental component in prevalent models of occupational stress (job demands–resources model, e.g. Bakker & Demerouti, 2007; conservation of resources theory, Hobfoll, 1989; Shirom, 2011) and models of job burnout (e.g. Demerouti, Bakker, Vardakou, & Kantas, 2003; Maslach & Jackson, 1981; Shirom, 2011). In relation to the three dimensions of work fatigue, burnout has been identified as a physical, mental, and emotional response to chronic stress and has received a great deal of research attention because of its relevance in today's workplace (e.g.

Frone & Tidwell, 2015; Shirom, 2011). Chronic stress arises when an individual does not fully recover between workdays (e.g. Rick, Acton, & Payne, 1988), resulting in fatigue (Frone & Tidwell, 2015). Work fatigue occurs in respect of the expenditure and depletion of these three "types of energetic resources" (p. 2), one of which is an emotional energy resource, "involving expression and regulation of emotions" (p. 2). Consequently, a huge and frequent expenditure of emotional resources may result in emotional work fatigue.

The previous subchapter on stress outlines how a poor privacy fit may result in stress in the context of P-E fit theory and appraisal theory. P-E fit theory is particularly suitable for the investigation of fatigue. As already pointed out, fatigue is a likely result of frequent or chronic stress rather than infrequent acute stress (Beehr, 1988; Maslach & Goldberg, 1988). P-E fit theory incorporates both chronic and acute stress conceptualisations. Further, P-E fit theory is popular in health care and behavioural sciences and gives solid empirical support for burnout and emotional fatigue (Edwards & Harrison, 1993; Jamal & Baba, 2000; Vandenberg, Park, DeJoy, Wilson, & Griffin-Blake, 2002).

Appraisal theory has elicited empirical results on frequent experience of stress and negative affect and fatigue. Folkman, Lazarus, Gruen, and DeLongis (1986) showed that individuals who frequently appraised person-environment encounters as negative had decreased levels of psychosomatic health, which included forms of fatigue. Frequent experience of negative emotions requires regulation of these emotions (e.g. Folkman & Lazarus, 1985), which over time can lead to depletion of emotional energy, resulting in emotional fatigue (cf. Frone & Tidwell, 2015). Appraisal theory outlines how a negative appraisal of a person-environment encounter (such as poor privacy fit) results in negative emotions. Further, it identifies coping appraisal as a gatekeeper to the emotional response towards a stressor (Folkman & Lazarus, 1985).

Empirical evidence on poor privacy fit resulting in emotional fatigue is rare, notwithstanding conceptual variations. Laurence et al. (2013) linked emotional fatigue to

privacy. Their study indicated a relationship between task and communication privacy (scale by Oldham, 1988) and emotional fatigue (using a subscale of the Maslach Burnout Inventory). There is evidence that frequent noise-induced occupational stress results in fatigue (e.g. Klitzman & Stellman, 1989) and emotional exhaustion (Topf & Dillon, 1988). While existing evidence used well-operationalised conceptualisations of emotional fatigue, the operationalisations of privacy were limited. By employing a multidimensional operationalisation of privacy and using a transactional stress approach, the present research examines whether frequently poor work privacy (or privacy fit) is associated with increased emotional fatigue levels. Further, it will be investigated whether coping appraisal mediates the relationship between frequently poor work privacy (or privacy fit) and fatigue.

2.2.2.4 Privacy, Coping Appraisal, & Mental Fatigue

Mental work fatigue is the second of three dimensions of Frone and Tidwell's (2015) burnout framework. Mental work fatigue occurs in respect of the frequent expenditure of mental energy resources, which involves cognitive processing. Consequently, huge expenditures of mental resources result in mental work fatigue. Mental resource expenditure is likely when dealing with a poor privacy fit during task completion because of the cognitive processing involved in task completion being hindered, e.g. by acoustical and visual distractions and interruptions (inputs), or trying to keep conversations or work confidential (outputs).

In theoretical works, frequent input such as distractions or stimuli in the work environment that are characterised as uncontrollable and take away attention have been linked to cognitive depletion in office workers (cf. Cohen, 1978; cf. Sundstrom & Sundstrom, 1986). Supporting empirical evidence is reduced to the effects of frequent noise distractions on mental fatigue (Cohen & Spacapan, 1978). Laurence et al. (2013) suggest an effect of output controls, such as keeping work and conversations confidential, on mental fatigue. They postulate that controlling outputs while pursuing work assignments requires workers "to

divide their mental attention" (p. 145). Dividing attention requires additional expenditures of mental resources and can lead to cognitive fatigue when experienced frequently (e.g. Leroy, 2009).

Expenditure of cognitive resources because of the process of stress appraisal has been suggested (cf. Kahneman, 1973; Lazarus, 1966; Scott et al., 2015). Consequently, it has been proposed that mental fatigue is a likely result if environmental demands are frequently experienced as stressful (Cohen & Spacapan, 1978). Therefore, this thesis will investigate whether coping appraisal explains some of the effect of frequent poor work privacy (or privacy fit) on mental fatigue. Further, the present research aims to extend the current literature by assessing whether a multidimensional operationalisation of poor privacy fit (inputs and outputs) is associated with mental fatigue.

2.3 Contextual Factors Associated with Work Privacy

2.3.1 Terminology

Contextual variables that facilitate the management of demands in a work environment are a central element in theories of stress and privacy regulation. Collectively, these theories refer to environmental or job demands as stressors; demands are aspects at work that require cognitive and/or emotional effort, thereby incurring "physiological and/or psychological costs" (Bakker & Demerouti, 2007, p. 312). However, these theories vary in the terminology on contextual variables to manage these demands. Altman (1975) refers to antecedent factors that contribute to achieved levels of privacy, which he clusters into personal characteristics, interpersonal characteristics (e.g. cohesion), and situational factors (e.g. environment). Cognitive appraisal theory refers to antecedent factors or resources that contribute, inter alia to coping appraisal, such as situational variables (situational constraints) or personal variables (personal resources) (cf. Lazarus, 2006; cf. Lazarus & Cohen, 1977). Prevalent occupational stress theories such as the job demands–resources model (e.g. Bakker & Demerouti, 2007),

conservation of resources theory (Hobfoll, 1989; Shirom, 2011), and the occupational person-environment fit theory (Edwards & Cooper, 1990) refer to work environment resources that help to manage or protect from demands at work. As the present research touches on most of these theories to a greater or lesser extent, the umbrella term "contextual factors" is used to refer to environmental resources that support the achievement of privacy fit and that are associated with coping appraisal.

2.3.2 Existing Evidence

Previous research work on privacy and contextual factors has shortcomings. Points of critique include, for example, the great number of single and non-validated findings, and findings being out of date. The majority of the research was conducted in the 70s, 80s, and 90s and therefore has not explored new office concepts in great depth. Another shortcoming is conflicting findings. For example, it was suggested that the sense of privacy increases with the number of enclosed sides or the height of enclosing partitions (BOSTI, 1981; Brill et al., 1984; Johnson, 1991 in Kupritz, 2000; O'Neill, 1994; Sundstrom et al., 1980; Sundstrom, 1986). Whilst Brill et al. (1984) postulate that the number of partitions enclosing a workspace is of key importance due it its mediating effects between height and privacy experience, it appears that multiple investigations of single contextual variables in contrast to a combined investigation of multiple contextual variables lead to different results and effects sizes (e.g. O'Neill, 1994). However, no subsequent research has yet attended to these points of critique. The present research aims to address one of these points by shedding light on how contextual factors in new work environments, such as ABW, can help or hinder privacy regulation. It is acknowledged that contextual factors have been established that are associated with privacy desires but they will not be explored in the present research. Next, a short overview on the previous findings on contextual variables will be given by presenting a previously developed

model by Kupritz (1998). The applicability of the findings for new work environments, such as ABW, will be reviewed, and the merit of the findings will be critiqued.

2.3.2.1 Kupritz's Model of Privacy-Associated Contextual Factors

Previous work privacy research has been largely occupied with the effect of different environmental settings on occupants' privacy experience. A few, mostly qualitative, studies have also explored how the social environment at work can help or hinder privacy regulating behaviour. Some scholars aimed to structure the various empirical accounts on contextual factors that influence work privacy (e.g. Altman, 1975). Kupritz (2000) presented the most coherent account so far. She developed a detailed conceptual model of mechanisms that support privacy regulation at work based on empirical evidence (cf. Kupritz, 2000). The model has three superior dimensions, which are environmental, social, and behavioural mechanisms to privacy regulation.

Environmental mechanisms include any physical resources that provide opportunities for regulating social interaction. By referring to previous research, Kupritz (2000) lists examples such as rooms (e.g. Johnson, 1991 in Kupritz, 2000), walls, and partitions (see above), or the presence of a door (Duvall-Early & Benedict, 1992; Johnson, 1991 in Kupritz, 2000; Sundstrom, 1986). It was suggested that in the absence of enclosure by walls or partitions, privacy could be obtained by using other physical barriers, such as plants. Most other accounts listed are single unvalidated findings such as atmospheric properties (light levels, Goodrich, 1982; olfactory elements, Davis, 1990 in Kupritz, 2000), spatial density (Oldham, 1988), the shape of rooms (Zeisel, 1984), lines of sight (Mehrabian, 1976), or the symbolic value of spatial elements that suggest privacy (Johnson, 1991 in Kupritz, 2000). The list includes sound-masking environments by overlying sound such as white noise. Numerous empirical accounts can be found in the literature that support sound-masking effects as being beneficial for reducing noise disturbances (e.g. Herbert, 1980; Hongisto, 2008; Jiang, Liebl,

Leistner, & Yang, 2012). Another element listed are properties of seating arrangements, for example having workspaces located away from the main traffic flow (Johnson, 1991 in Kupritz, 2000). This is a reasonable concept for fixed workspaces. However, for desk sharing, which is predominantly practised in modern working environments (e.g. in ABW offices), a desk in an open-plan office does not necessarily need to be shielded from visual distractions (Appel-Meulenbroek, Groenen, & Janssen, 2011). This is because ABW requires the employee to seek out work settings that match their task at hand (e.g. Engelen et al., 2018). In ABW environments, open-plan desks are meant to be used for tasks that can be performed with reasonable acoustical and visual input. Overall, a systematic validation of prior empirical results appears to be difficult, as previous attempts have shown (e.g. O'Neill). The inclusion of several environmental variables into one model has resulted in findings that conflict with previous results, possibly due to interaction effects between variables.

Social mechanisms that support privacy regulation at work have been clustered into two elements, policy support and social support. Kupritz (2000) refers to Justa and Golan's (1977) work on privacy and lists policy elements that are supposed to facilitate privacy regulation, such as access policy and autonomy over confidential files. Some elements, however, refer to general environmental controls rather than specific privacy controls such as thermal control or choice of decor. Social supports capture any implicit social rules and norms in the social work environment. By referring to the works of Gusta and Golan (1977) and Steele (1986), Kupritz (2000) gives examples, some of which can be transferred to an open-plan office context. These examples are accepted volume of speech and the content of conversations with colleagues present or over the phone. Kupritz does not touch on how these helpful social norms come about or can be steered. The present research acknowledges that the exploration of social rules at work are part of gaining a total understanding of the work environment and that these rules are paramount in designing for privacy.

Behavioural mechanisms are, according to Kupritz, "the overt and cognitive behaviours people use to modify the environment or modify themselves in order to conform with the environment" (p. 53). Kupritz not only refers to types of behaviours that workers employ to gain privacy fit but also lists a range of individual characteristics that determine individuals' desire for, and appraisal of, privacy. Hence, these accounts do not fall into the category of contextual factors per se. However, explanations of behaviour shed light on how contextual mechanisms can help or hinder privacy regulation when used. As for behaviours, Kupritz (2000) refers to the use of territorial markers as a non-verbal mode of communication to signal the need for privacy, strategically seek out, or adapt settings to control social interactions (e.g. closing a door or rearranging furniture to shield oneself from others). These accounts were substantiated by individual, qualitative, and non-validated empirical findings (Archea, 1977; Hedge, 1982; O'Neill, 1994; Sundstrom, 1986). Other non-verbal (e.g. body language) or verbal cues are listed (e.g. Altman, 1975; Altman & Chemers, 1980). As for individual characteristics that determine individuals' desire for, and appraisal of, privacy, Kupritz refers to aspects rooted in different theoretical conceptions. It seems that the content of this section is informed by the aim to cover the completeness of empirical findings on the topic rather than by a theoretical argument. For example, it is mentioned that individuals adapt their perception of disturbing noise in office environments over time. However, findings on the topic are greatly conflicting, with some studies pointing to successful adaptation (e.g. Hedge, 1982; Helson, 1964; Sundstrom, 1986) and others pointing to quite the opposite (cf. Weinstein, 1982). Further, Kupritz (2000) refers to Mehrabian's work (1976) on individual differences in screening abilities. Screening describes the process of blending out environmental stimuli and thereby reducing environmental load and leading to a reduced arousal state. Environmental load was defined as the amount of information perceived in the environment in the form of stimuli (Mehrabian, 1976). Screening abilities can potentially explain individual variance in privacy appraisal. Another element of personal characteristics

Kupritz (2000) draws on is perceptions of control. There are numerous empirical accounts on how the perception of being able to control an environmental stressor reduces the stressing effect (e.g. Campbell, 1983; Frankenhauser & Gardell, 1976; O'Neill & Carayon, 1993). Further, privacy has been positioned to be achieved by controlling social interactions (e.g. Altman, 1975). As control is a coping mechanism (e.g. Lazarus, 1993), it is logical that feeling in control over regulating social interactions could modify privacy-related stress appraisal.

Overall, Kupritz's (2000) accounts on privacy regulating or territorial behaviour create a useful link to the aforementioned environmental mechanism. It becomes clear how environmental settings can increase or reduce opportunities for regulating behaviour and for achieving privacy fit. Although her accounts are rather short on social mechanisms that support privacy regulation at work, it is argued that there is also a link to privacy regulating behaviours. It is suggested that social mechanisms at work can equally increase or reduce opportunities for achieving privacy fit. The present research postulates that, in order to account more fully for any variance in privacy fit, one must address not only the objective, the physical environment, but also the social environment at work. Furthermore, the empirical accounts that informed Kupritz's model came primarily from the 70s, 80s, and 90s and did not include evidence on modern office concepts such as ABW. ABW environments are particular in their environmental and cultural make-up, which can increase opportunities for privacy regulating behaviour and for achieving privacy fit. Hence, the present research explores environmental and social specifications of ABW environments and their opportunities for executing privacy regulating behaviour. The subsequent chapters will develop this postulation in detail.

2.3.3 Activity-Based Working: Description & Existing Evidence

2.3.3.1 Description

One of the pioneering concepts of new office concepts proclaims that activity-based working (ABW) within a *Bürolandschaft* (office landscape) is the optimal mode of running an open-plan office (e.g. Engelen et al., 2018). ABW describes a work style that encourages employees to perform work tasks in work settings that match the task at hand. Although the term "activity-based working" seems to prevail, similar concepts have been referred to as "agile working", "flexible working", "new ways of working", and "Business Club office", among others (e.g. Engelen et al., 2018; Konkol et al., 2017). ABW has been described as being grounded in a "holistic approach to work style" that optimises the environmental, technological, and behavioural conditions (Engelen et al., 2018, p. 1, referring to Veldhoen + Company, 2014). Although ABW was introduced in the 90s (Veldhoen, 1995), in some countries it has only started to gain popularity in the last five to ten years (Engelen et al., 2018). Reviewing the workplace design industry literature on ABW (e.g. cf. Appel-Meulenbroek, Clippard, & Pfnür, 2018; Hoendervanger, de Been, van Yperen, Mobach, & Albers, 2016; Keeling, Clements-Croome, & Roesch, 2015), ABW seems to be based on three contextual variables that are critical to privacy regulation. According to Kupritz's (2000) classifications, one of the three elements, work settings, is an environmental mechanism, and the last two protocols, and location autonomy, are social mechanisms.

Work settings refer to a multitude of places in the office that differ in their designs to support the various tasks an office worker might face throughout the day. Naturally, these settings vary in their degree of connectedness with people, which makes them an important contextual variable for privacy regulation. A workplace that supports ABW typically has settings that range from modular project spaces that support interactive collaborative work to sheltered spaces, such as a room in room concept, to support highly concentrated individual work. Often ABW environments are characterised as non-territorial workplaces without, or

only with some, allocated seating but where workers are seated in neighbourhoods allocated to a team (e.g. Engelen et al., 2018). Desks are mostly shared among employees (Appel-Meulenbroek et al., 2011; Wyllie, Green, Nagrath, & Town, 2012).

Protocols refer to an office etiquette on how to use different types of office spaces correctly to steer behaviours and prevent misunderstandings and conflict (Oseland, 2009). It is suggested that protocols can be a useful tool for fostering helpful social norms (Oseland, 2009). Hence, protocols can be a useful contextual variable for privacy regulation.

Location autonomy is an element of work culture that refers to employees' ability to choose their preferred work location in the office rather than just sitting in sight of their manager (Wohlers & Hertel, 2017). ABW is supposed to provide the freedom for workers to make individual choices about their work style and work location (Engelen et al., 2018). Hence, location autonomy gives workers the freedom to regulate privacy from a work cultural perspective. Overall, it has been argued that ABW is helpful in regulating interpersonal contact in open-plan spaces (e.g. Oseland, 2009; Flynn, 2014) – a claim often made by the industry (building developers and designers) but not yet well supported by empirical evidence (Engelen et al., 2018) as the following subchapter will show.

2.3.3.2 Existing Evidence on Activity-Based Working

Findings on privacy regulation being supported in ABW environments are mixed. This is possibly due to high variance in environmental (e.g. work settings) and social (e.g. protocols, location autonomy) mechanisms that workers could employ for meeting their privacy needs. However, this explanation on the conflicting results remains speculation, as none of the studies have considered potential biasing variance in physical environmental properties of the work environment and very few have evaluated any socio-environmental characteristics. Further, most studies have considerable methodological and analytical weaknesses (e.g. weak measures of privacy, no control for different organisations in mixed samples, small sample size, more advanced statistical procedures required, and so forth) or do

not give full accounts on methods, study design, or sample characteristics (e.g. Appel-Meulenbroek et al., 2011; Brunia, de Been, & van der Voordt, 2016; de Been & Beijer, 2014; van der Voordt, 2004). Further, a decrease of privacy fit as reported in some studies could also be explained by negative feelings related to any office move that was part of some study designs and none of the studies controlled for. Lütke Lanfer, Pauls, and Göritz (2017) postulate that studies that follow an office move ought to control for negative feelings related to change due to possible biasing effects. Furthermore, when drawing conclusions on the evidence, one must be cautious in paying attention to the office types the ABW environments were compared to in the studies. As the following accounts will show, ABW environments seem to support privacy needs better than open-plan offices, while some ABW environments are not better at supporting privacy fit than cellular offices.

Evidence on ABW supporting privacy regulation was found in six studies (Appel-Meulenbroek et al., 2011; Blok, Groensteijn, Schelvis, & Vink, 2012; Brunia et al., 2016; Keeling et al., 2015; Robertson, Huang, O'Neill, & Schleifer, 2008; van der Voordt, 2004) as listed in a systematic literature review on ABW by Engelen et al. (2018). One of these studies (Robertson et al., 2008) also tested perceptions of location and job autonomy where the worker feels they can decide, how, when and where to do the work. It was reported that agile workspaces were perceived as better than open-plan offices for controlling interactions with colleagues and for the control of information. Notions of general privacy increased in an ABW intervention in a study by Robertson et al. (2008). In terms of output controls, Keeling et al.'s (2015) sample reported better control of confidential conversations in the ABW environment than in open-plan offices. They also stated that their ABW office is good for confidential work as cellular offices. Similarly, Appel-Meulenbroek et al. (2011) reported that workers felt comfortable having confidential conversations in the ABW office and they did not feel particularly exposed. Accounts on improved input controls relate to noise levels and interruptions. Three studies reported a reduction in the number of distractions in ABW

environments. Blok et al. (2012) found that distractions were perceived to be fewer in ABW offices than in their "traditional work environment" (p. 2606). Van der Voordt (2004) put this improvement down to the use of concentration spaces. Keeling et al. (2015) found both positive and negative effects. Overall, they concluded that agile workspaces were as good as cellular offices and better than open-plan offices for working without visual and acoustic distractions. Keeling et al. (2015) found that agile workspaces were perceived as particularly useful for both output controls (control of information) and input controls (control of social interactions). Also, Brunia et al. (2016) reported that respondents were satisfied with the opportunities that ABW environments offer for doing concentrated work.

Evidence on ABW not supporting but hindering privacy regulation was found in eight studies (Candido et al., 2016; de Been & Beijer, 2014; de Been, Beijer, & den Hollander, 2015; Gorgievski, van der Voordt, van Herpen, & van Akkeren, 2010; Keeling et al., 2015; Kim, Candido, Thomas, & de Dear, 2016; Medik & Stettina, 2014; Seddigh, Berntson, Bodin Danielsson, & Wetserlund, 2014) as listed in the systematic literature review by Engelen et al. (2018). One of these studies (Gorgievski et al., 2010) also tested perceptions of general control over the office environment, which decreased after the move from a cellular to an ABW office and could explain difficulties in achieving privacy fit. One study explored location and/or job autonomy (Medik & Stettina, 2014), which increased in ABW. Therefore, a lack of autonomy does not seem to account for issues with privacy regulation in these particular studies. Notions of general privacy decreased in ABW in comparison to cellular offices in studies by Keeling et al. (2015) and by de Been and Beijer (2014). As for output controls, de Been et al. (2015) reported that occupants of ABW offices found it difficult to have private conversations. Gorgievski et al. (2010) and Candido et al. (2016) found that their samples found it more difficult to have confidential phone calls in an ABW office than in cellular offices. In addition, ratings for visual privacy were worse in ABW offices than in cellular offices. Accounts on input controls relate to noise levels and unwanted interruptions.

Kim et al. (2016) and Seddigh et al. (2014) reported increased distractions from others' conversations or other sounds in comparison to cellular offices. Kim et al. (2016) and Candido et al. (2016) reported an increase of unwanted interruptions in ABW environments in comparison to cellular offices.

2.3.4 Investigating Impacts of Work Settings, Protocols, & Location Autonomy

In conclusion, there is mixed evidence on ABW environments, which is possibly due to social and environmental variation in the study population and to methodological variation and weaknesses in the studies. The following subchapters will present three context variables that have been identified in the previous subchapter as being key for privacy regulation in ABW environments and that could account for the social and environmental variation in previous results.

2.3.4.1 Privacy, Coping Appraisal, & Work Settings

Work settings are an environmental mechanism or a physical resource that provide opportunities for regulating social interaction at work. As explained in a previous subchapter, the variety of work settings refers to a multitude of workplaces that differ in their designs in supporting the various work tasks and are a requirement for ABW environments (cf. Keeling et al., 2015). Flynn (2014), Keeling et al. (2016), and Oseland (2009) suggest that these types of settings are helpful in regulating interpersonal contact in open-plan offices. According to behaviour settings theory (cf. Barker, 1968), places that are distinctively different and are linked to certain behaviours or social norms provide coherence in social settings. Therefore, offices that offer a variety of settings to support distinctively different tasks (and types of privacy) could provide an optimal environment for privacy regulation. For example, working by oneself quietly in a "library zone" in the office, it would be unacceptable if someone talked loudly or if a colleague was to approach someone in the library space if it was not for a good reason. However, there is relatively little and conflicting evidence to support the usefulness of

task-based settings for privacy regulation as the previous subchapter has shown. Most of the evidence does not specifically test the relationship between the experience of environmental variety and privacy. Further, evidence can be found in non-peer-reviewed industry journals but information on study design and methods is scarce (e.g. Flynn, 2014). Additionally, it seems that none of the peer-reviewed or industry studies assessed privacy in a multidimensional way and/or acknowledged the temporal nature of privacy needs. Limitations to this approach to assessment will be demonstrated in Chapter 3. Due to the limitations of previous research, the present research aims to test the relationship between the frequency of privacy fit and the variety of work settings.

As the present research aims to assess not only the relationship between contextual factors typically found in ABW environments and privacy fit but also that between contextual ABW factors and coping appraisal, it will be observed whether the variety of work settings is linked to coping appraisal (see Chapter 1 for an explanation of the model on privacy fit and appraisal). This aim finds support in stress appraisal research, which identified environmental characteristics as an influential factor in the appraisal process as they can be perceived as a coping resource (Lazarus & Cohen, 1977, p. 89): "[T]he environmental setting … provides and withholds the resources people find it necessary or useful to draw upon in coping." Coping appraisal involves the evaluation of the controllability of a stressor (e.g. social inputs and outputs) and the quantity and variability of a person's coping resources that are available. Therefore, it is argued that variety of settings can be perceived as an environmental resource to deal with privacy-related stress and is therefore meaningful in assessing one's coping appraisal. Hence, the present research will test the relationship between coping appraisal and the variety of work settings.

2.3.4.2 Privacy, Coping Appraisal, & Protocols

Protocols fall into the category of social mechanisms. They explain how the environmental and social mechanisms can interact to support the regulation of social interaction. Protocols refer to an office etiquette on how to use different types of office spaces correctly to prevent misunderstandings and conflict (Oseland, 2009). For example, a guideline could be not to have calls on speakerphones in the open-plan office. Scholars have referred to the presence and importance of social norms that implicitly cue what workers should and should not do in a given work setting (Justa & Golan, 1977; Steele, 1986). However, these explanations did not explore tools for steering helpful social norms. The present research argues that protocols can be a tool for fostering supportive social norms in a work environment. Further, and in line with behaviour settings theory (cf. Barker, 1968), protocols could increase the coherence of different settings as they underpin the rules of using them. In addition, the use of protocols would make settings more effective. For example, if everyone in a quiet zone adhered to the protocol of being quiet, then a quiet zone would be more effective for concentrated work (little social input). There is some peer-reviewed evidence (Brennan et al., 2002; Hedge, 1982) and industry research evidence (e.g. Bellingar, Kupritz, & Haworth, 2006; Kupritz & Haworth, 2005) on the usefulness of protocols in decreasing disturbances by colleagues, but only in standard open-plan environments. The present research aims to explore whether, in an ABW office, others' adherence to protocols supports workers in achieving privacy fit.

Further, the present research aims to test whether adherence to protocols increases privacy-related coping appraisal. It is proposed that a clear set of rules and the belief that these rules are acted upon could increase the perception of having the resources to cope with poor privacy fit. This could be explained by an increased sense of predictability towards privacy invasion. Predictability is an established stress characteristic and can facilitate

adaptation in terms of both avoiding future difficulties (i.e. seeking the correct settings for one's needs) and dealing with present ones (Baum, Singer, & Baum, 1981; Lazarus & Launier, 1978). A number of studies have demonstrated the value of such information as it applies to the regulation of emotion or to the regulation of the environment (e.g. Johnson & Levanthal, 1974; Langer & Saegert, 1977). It is suggested that information gained through protocols increases one's sense of control and one's confidence in coping efficacy (e.g. Janis, 1968 in Baum et al., 1981), thereby increasing coping appraisal.

2.3.4.3 Privacy, Coping Appraisal, & Location Autonomy

Location autonomy falls into the category of social mechanisms. Location autonomy refers to employees' ability to choose their preferred work location in the office rather than just sitting in sight of one's manager. There is no established term to describe this variable. However, due to its closeness to the concept of job autonomy (Szilagyi & Holland, 1980), the term "location autonomy" was chosen. Job autonomy can be defined as "a practice ... to give employees increasing decision-making authority in respect to the execution of their primary work tasks (Leach, Wall, & Jackson, 2003, p. 28). Job autonomy is a core dimension of job design in prevalent job design models (e.g. job characteristics model by Hackman & Oldham, 1975 in Ostroff et al., 2003). Such characteristics of a well-designed job have been identified to relate to the motivation and satisfaction of employees (Ostroff et al., 2003). Kanter (1993) suggests that job autonomy is a structural empowerment that directly affects workers' level of control (Lin, Lin, Lin, & Lin, 2013). Wohlers and Hertel (2017) point out that the culture of an ABW workplace relies on support from management. Management ought to empower workers to work flexibly. Elements of location autonomy, such as a working-from-home policy, can be part of policy support for privacy regulation (cf. Kupritz model, 2000). Scholars have suggested that location autonomy provides the freedom to regulate interpersonal access and therewith privacy (Flynn, 2014). There is some empirical evidence on the usefulness of location autonomy and job autonomy in ABW environments with regard

to privacy regulation (Robertson et al., 2008). Hence, it seems that perceptions of flexibility in working time and location autonomy, where the worker feels they can decide when and where to do the work, are useful for regulating privacy. This present research aims to validate this preliminary finding of previous research by testing whether location autonomy increases privacy fit.

As this thesis aims to assess not only the relationship between social ABW factors and privacy fit but also links between social ABW factors and coping appraisal, it will be observed whether location autonomy is associated with coping appraisal. Conceptually, location autonomy is related to job autonomy. Whilst location autonomy provides the freedom to decide when and where to work, job autonomy provides the freedom to decide how one's job is structured and conducted. Both variables have been treated as being conceptually close in previous empirical research (Medik & Stettina, 2014). Appraisal research shows that job autonomy predicts job-stress appraisal (e.g. Prem, Kubicek, Diestel, & Korunka, 2016). In this line of thinking, it is postulated that location autonomy is another type of resource for handling privacy-related demands, and therefore increases the associated appraisal of coping resources.

2.4 Chapter Conclusions

This chapter has described the literature in terms of evidence on the consequences of poor work privacy. The chapter highlighted that knowledge is limited and that previous research employed weak conceptualisations of privacy. It emphasised the need to validate previous findings and speculations with a multidimensional conceptualisation and measure of privacy. Further, it was argued that it is worthwhile extending past research by investigating whether privacy-related coping appraisal mediates the relationships between poor privacy fit and stress-related consequences at work. These relationships will be examined in the empirical chapters of the present research (Chapters 4–8).

Further, the chapter described the literature in terms of evidence on privacy-associated contextual factors in different types offices including a new and influential office concept, ABW. The chapter pointed out that evidence is sometimes conflicting, mostly focused on old office concepts, and is scarce on fundamental factors in ABW environments, such as the variety of work settings, protocols, and location autonomy. This highlighted the need to explore whether ABW offices are conducive to meeting privacy needs. The specific role of the three ABW-typical contextual factors in privacy fit and privacy-related coping appraisal will be examined in the following empirical chapters (Chapters 4–8).

As it became apparent that the investigations of this thesis require a multidimensional operationalisation (measure) of work privacy building on Altman's (1975) conceptualisation, the following chapter will give an overview on how prior work privacy definitions have been operationalised. It will present a review on prior measures of work privacy and will highlight the need to develop a new quantitative measure of privacy fit at work.

3 Chapter Three:

Previous Measures of Work Privacy – A Review

3.1 Chapter Introduction & Review Aim

This chapter reviews a selection of measures of work privacy to highlight the need to develop a new quantitative measure of privacy fit – one of the aims of this thesis. The aim of the review was to explore conceptualisations, dimensions, and individual items of prior work privacy measures and review them for their coherence and psychometric properties.

3.2 Method

3.2.1 Criteria for Inclusion

Inclusion criteria for the review of work privacy measures were followed as recommended by Thompson and Phua (2012). The criteria included: (1) a systematic development of the measures themselves or those from which they are derived; (2) evidence of validity; (3) corresponding ostensible purpose of the measures; (4) potential applicability to a wide range of individuals across a broad range of office and job levels at different organisations. Further inclusion criteria were added: (5) quantitative studies; (6) full details of measures; (7) English language; (8) psychometrically acceptable scale formats.

3.2.2 Search Strategy for Identification of Studies

Electronic databases were searched using the University of Surrey library databases page and Google Scholar. The databases were PsychINFO, PsychARTICLES, Psychology and Behavioural Science Collection, ScienceDirect, and Web of Science. Databases were searched using the following descriptors: 1 “privacy & work”; 2 “privacy & office”; 3 “privacy & open-plan”; 4 “privacy & open plan”. These terms were selected based on their occurrence in the available literature on work privacy. An extensive search of the literature was then conducted. Studies in English up to October 2018 were searched. The reference lists of relevant studies were also checked for other articles. Further, two systematic reviews that

were concerned with work privacy research and other topics informed the search (de Croon et al., 2005; Engelen et al., 2018).

3.2.3 Review Process

The search elicited a total of 308 articles. Titles and abstracts of articles that were found in the search were screened to ensure they met the inclusion criteria. For those that appeared potentially suitable, full-text versions were sourced. Full texts were obtained for 38 articles. The full texts obtained were further screened to ensure they met the inclusion criteria. On the basis of the inclusion criteria, 27 full texts were excluded. This was mostly on the basis that the additional detail in the full texts showed that studies used measures developed by other scholars, did not give full details on the measures, or had psychometrically unacceptable scale formats. Some further studies were excluded on the grounds that they turned out to be qualitative. Ethical approval was not necessary as this was a review of the literature.

3.3 Results

After all exclusions, 11 articles were of relevance to the review. The 11 selected instruments were developed to assess work privacy, or some part of it. Although most of these measures were not created to assess work privacy multidimensionally or transactionally, it is useful to determine the extent to which their underlying conceptual definitions and items represent privacy at work. In the following sections, each of the 11 measures will be reviewed for their conceptualisation and item constructions. See Table 1 on the following pages for an overview of the gathered evidence.

Table 1
Summary of 11 prior work privacy measures

Instrument	Privacy Sundstrom et al. (1982a)	Satisfaction with privacy Sundstrom et al. (1982b)	Personal privacy Zalesny & Farace (1987) based on Goodrich (1978)	Need for privacy Oldham (1988)	Experience of privacy Crouch & Nimran (1989)	Privacy O'Neill (1994)	Quality & office layout Zagreus et al. (2004)	Sat. with privacy and acoustics Veitch et al. (2007)	Privacy Rashid, Wineman, & Zimring (2009)	Need-For-Privacy Haans, Kaiser, & de Kort (2007)	Noise distraction & privacy Candido et al. (2016)
Construct	unclear	unclear	unclear	task & communicat. privacy	unclear	unclear	acoustical & visual privacy	unclear	unclear	privacy regulating behaviour	unclear
Construct definition	ability of individuals … to satisfactoril y regulate their accessibilit y to others	ability of individuals … to satisfactorily regulate their accessibility to others	none / not accessible	none	control over access to oneself , control over information about oneself and control over communicatio n from others (Altman, 1975)	degree to which the employee feels a sense of being on display to others and auditory privacy	none / not accessible	none	none	Altman's definition	none
Total # of items	1	5	7	6	3	4	2	10	6	25	4
Rating	7-point scale of degree (privacy)	5-point agreement scale	7-point agreement scale	5-point agreement scale	7-point accuracy scale	5-point agreement scale	7-point satisfaction scale	7-point satisfaction scale but actually items referred to frequency (distractions) and different degrees (noise, privacy)	5-point agreement scale	5-point frequency scale	7-point agreement and satisfaction scales
Dimensions and # of items:											
General privacy	1	2	-	-	1	2	-	-	2		-
Acoustical / visual stimulation (input)	-	-	3	-	-	-	-	2	-		1

Task privacy as in Interruptions (input)	-	1 long periods	-	2	1	-	-	1	-		1
Communication/ speech privacy (output)	-	1 confidentiality	1	2	-	1	-	1	2		1
Acoustical privacy – one overhearing others and others overhearing oneself (input & output)	-	-	-	-	1	1	1	-	-		-
Disturbing others	-	1	-	1	-	-	-	-	-		-
Visual privacy / observation (output)	-	-	1	-	-	-	1	1	-		1
Other privacy constructs, i.e. Arch. privacy	-	-	-	-	-	-	-		-	25	-
Non-privacy constructs, outcomes or correlates	-	-	2 concentration, irritation	1 concentration	-	-	-	5 enclosure, distance of desk, size of desk, adaptability of work area, aesthetics	2 visual control by supervisor, adjustable workspace		-
Scale development following standards	no	no	unclear	no	no	no	no	yes	no	yes	yes
Internal consistency reliability	no	yes	no	yes	no	yes	no	yes	yes	yes	yes
Temporal stability	no	no	no	no	no	no	no	no	no	no	no
Convergent validity	*yes*	*yes*	no	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	yes
Discriminant validity	no	no	no	no	no	no	no	no	no	yes	no
Cross-population equivalence	*yes*	*yes*	*yes*	*yes*	*yes*	no	*yes*	*yes*	*yes*	yes	no
Problematic clarity or ambiguity	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Note. Italics refer to suggestive information on validity.

3.3.1 Individual Measure Review

3.3.1.1 Privacy Measure by Sundstrom et al. (1982a)

Sundstrom et al. (1982a) developed a one-item measure of privacy that was reprinted in a book chapter by Sundstrom (1986). Overall, their conceptualisation of privacy is reductionist and the measure is inconsistent with the definition, and poorly constructed. In the following, each point of critique will be explained. After drawing on several concepts of general privacy, Sundstrom (1986) concluded with the definition that privacy is "the ability of individuals … to satisfactorily regulate their accessibility to others" (p. 178). Although referring to Altman's framework (1975), the authors simplified the definition by excluding input and output controls and therewith excluding indirect social stimuli, such as noise coming from others. Evidently, another measure used in the study assessed satisfaction with noise levels separately and results are presented unrelated to privacy. Further, by focusing on regulating accessibility and probably input from others, control of outputs that individuals make to others, such as task and conversation confidentiality, is excluded. Consequently, output controls were not measured. Not in line with the presented definition, a separate part of the survey assessed distractions in the office. The results of distractions were not associated with privacy in the results and discussions on the write-up. Sundstrom et al. (1982a) acknowledge that certain situational factors, such as job type and task characteristics, can influence the level of privacy one desires. However, desires for privacy or their dynamic nature were not specifically assessed. The one-item measure used asks participants to rate the degree of their general privacy in their office on a seven-point Likert scale ranging from "*Not Private (1)*" to "*Private (7)*". The use of this item is problematic as the object under investigation is unspecified and was not presented alongside a definition of privacy. It could spark a range of associations among the participants and lead to a high degree of measurement error. Moreover, Nunnally (1967) pointed out that the process of phenomenon

assessment should involve measuring the attributes of the phenomenon and not the phenomenon itself.

3.3.1.2 Satisfaction with Privacy Measures by Sundstrom et al. (1982b)

Sundstrom et al. (1982b) developed a five-item measure of privacy for a study that was reprinted in a book chapter by Sundstrom (1986). It assesses the overall status quo of privacy on a five-point agreement scale. Overall, their conceptualisation of privacy is reductionist and the measure is inconsistent with the definition, and poorly constructed. In the following, each point of critique will be explained. The same conceptualisation as in Sundstrom et al. (1982b) has been applied in this study and therefore previously mentioned points of critique apply in this context. Similarly to the first measure, the transactional potential in the assessment of privacy was not acted upon (e.g. assessment of desires, assessment of frequencies). Previous critique concerning the use of general privacy items applies to item 2 “I have sufficient privacy in my work area” and item 5 “I have enough personal privacy in my work area”. Not in line with the definition presented are item 1 “I can have a conference without distracting others” and item 3 “I can have confidential conversations easily” as both represent output controls of information. Item 4 “I can work uninterrupted for long periods” is consistent with the definition’s focus on regulating access and potentially input from others. All non-generic items lack precision in their phrasing as the (work) location they apply to is not specified.

3.3.1.3 Personal Privacy by Goodrich (1978) used in Zalesny & Farace (1987)

Zalesny and Farace employed a measure of privacy first published by Goodrich (1978) containing seven items. The measure assesses privacy on a seven-point agreement scale. Although the original paper was not accessible and the review is based on the information given in the paper by Zalesny and Farace, the measure was included because of its depth of privacy assessment. Overall points of critique include the absence of a definition of privacy and the inclusion of correlates of privacy. The concept of privacy was not explained in

Zalesny and Farace's paper, and it is not clear whether Goodrich used a strong conceptualisation for the item development. As the seven items are rather inconsistently constructed, it is assumed that no structured privacy definition informed their development. Overall, five items refer to input and output controls and two items refer to consequences of privacy. Of the five input and output control items, two refer to indirect acoustical and visual input by others working nearby or passing nearby. A third input control item refers to the provision of quietness required for doing work. The remaining two items refer to output controls with one item about conversation privacy and one about visual privacy. However, the last item is phrased vaguely and lacks explanation. In a cross-comparison of measures including the new measure developed in this thesis (Study 2), the input control items do not include interruptions and the output control item about visual privacy does not specify the different types of visual outputs (e.g. task confidentiality or panoptic effects). The final two items refer to correlates of privacy. The first asks about consequences of noise distractions (irritability and uneasiness) and the second item asks about the general concentration issue without referring to any privacy-related construction.

3.3.1.4 Task and Communication Privacy Measure by Oldham (1988)

Oldham developed a six-item measure to assess the status quo of privacy that consists of two scales: task privacy and communication privacy. Overall points of critique include an absent conceptualisation of privacy and poorly and non-psychometrically constructed items. The measure assesses the overall status quo of privacy on a five-point agreement scale. It does not have any of the desirable transactional characteristics outlined in Study 1. While Oldham did not lay out his understanding of privacy, the measure assesses some types of input and output control. Two of the task privacy items assess input controls by referring to interruptions. The third task privacy item assesses a correlate of privacy (concentration) and therewith includes a non-privacy construct. Three communication privacy items assess output

controls by referring to conversation confidentiality, i.e. talking in confidence at the workstation, the ability to have a personal discussion at work, and disrupting others at the workstation. Other input controls, such as noise from others, or output controls, such as task confidentiality, were not assessed. Therefore, the measure falls short on assessing the multidimensionality of privacy in depth.

3.3.1.5 Experience of Privacy by Crouch & Nimran (1989)

Crouch and Nimran developed a measure of privacy with three statements as items. The accuracy of each of the statements is assessed on a seven-point Liktert scale. Overall points of critique include a reductionist interpretation of Sundstrom et al.'s (1986) and Altman's (1975) definitions of privacy and items being constructed poorly (e.g. double-barrel item), and inconsequently to the conceptualisation. The researchers interpreted Sundstrom et al.'s (1986) definition of privacy as a *feeling* of control over access to oneself whereas the original definition is functional rather than affect focused ("the ability of individuals … to satisfactorily regulate their accessibility to others", Sundstrom et al., 1986, p. 178). Further, they draw on Altman and reduce his definition to "control over transmission of information about oneself to others and control over communication from others" (p. 143). In particular, the interpretation of input control from others is reduced as it only refers to communication that requires controlling as opposed to general "inputs from persons and stimuli outside the self" (Altman, 1975, p. 27). Consequently, in their study a variable unrelated to privacy assesses input controls concerning distractions at work from noise and movement. The three items used are lacking in clarity and are not clearly aligned with the conceptualisation outlined. The first item is inconsistent with the interpretation of Sundstrom et al.'s (1986) definitions but in line with his actual wording. It asks for possible "interruptions without warning" (pp. 143–144) and refers to input controls. The meaning of the item is unclear as an interruption without warning seems tautological. Presumably, the researchers meant to assess

the occurrence of impromptu meetings that were not scheduled. Other input controls as mentioned in the definition, such as control of communication from others, were not assessed. The second item refers to output control. Whilst in the definition output control refers to control of information about oneself, the measure refers only to the ability to have conversations without being seen or heard (item 2). Additionally to the reduced interpretation of the output dimension, the item is poorly constructed because it refers to two aspects (being seen and being heard) in one item (double-barrel). The final item refers to general privacy and its wording is unclear. It asks whether the "normal work position is private". Previously mentioned critique on items that refer to general privacy applies.

3.3.1.6 Privacy by O'Neill (1994)

O'Neill developed a four-item measure of privacy using a five-point Likert scale either assessing agreement or satisfaction. Overall points of critique include a reductionist definition and consequently a reductionist assessment of work privacy. Without drawing on previous conceptualisations of privacy, O'Neill defined work privacy as the "degree to which the employee feels a sense of being on display to others and auditory privacy" (p. 514). Consequently, two items refer to acoustical input control (overhearing conversations by immediate neighbours) and acoustical output control (others overhearing oneself if one talks in a normal voice). Other forms of input controls, such as interruptions, were not included. The third item refers to output control and panoptic effects but is rather unspecified for the work context. It asks whether one is "too exposed to the view of others while in" one's workspace. More specified forms of output controls, such as task privacy, were not included. The last item refers to satisfaction with general privacy. Previously mentioned critique on items that refer to general privacy applies. The combination of metrics (agreement and satisfaction) violates construct equivalence (e.g. Hussong, Curran, & Bauer, 2013).

3.3.1.7 Satisfaction with Acoustical & Visual Privacy by Zagreus et al. (2004)

Zagreus et al. (2004) developed an Occupant Indoor Environmental Quality (IEQ) survey at the Center for the Built Environment (CBE) at the University of California, Berkeley, which included two privacy items. The two items were included for review as, according to Kim and de Dear (2013), the "CBE's occupant survey questionnaire is one of the most widely used POE tools at present and is also prescribed within the IEQ section of building rating systems such as LEED (USGBC, 2009) and in Australia, NABERS (2009)" (p. 19). The two privacy items assess satisfaction with acoustical and visual privacy on a seven-point Likert scale. Overall points of critique include reduced assessment of privacy, poorly constructed items (e.g. double-barrel), and absence of a definition. In the absence of a definition of work privacy by Zagreus et al. (2004) due to unpublished scale report details, the review includes a study by Kim and de Dear (2013), who have drawn on secondary data collected through the IEQ survey. By drawing on previous studies, Kim and de Dear (2013) describe loss of privacy as being the result of failed isolation from unwanted sound (sound privacy), interruptions, and unwanted observation (visual privacy). Although the first item, "How satisfied are you with the sound privacy in your workspace (ability to have conversations without your neighbours overhearing and vice versa)?", is a double-barrel item, it does explain sound privacy. In contrast, the second item, "How satisfied are you with the level of visual privacy?", does not specify visual privacy, for example by referring to unwanted observations as the definition. As mentioned before, using unspecified items that refer to the overall research object rather than its attributes can increase measurement error and is generally not advised (Nunnally & Berstein, 1994). As already pointed out, sound privacy is assessed with a double-barrel item because it refers to both output controls (conversation output to others) and input controls (conversation input from others) in one item. Presumably, the second item, visual privacy, refers to observations and therefore to

output controls of information about oneself. However, in a work context other output controls such as task confidentiality might be of interest and should be specifically assessed.

3.3.1.8 Satisfaction with Privacy and Acoustics by Veitch et al. (2007)

Veitch and colleagues developed an 18-item office environmental satisfaction measure of which ten items are used to assess satisfaction with privacy and acoustics. It should be pointed out that the measure was developed to assess a range of "Satisfaction with environmental features" (p. 181). It was regarded as essential to include this measure in the review because of its widespread referral (ScienceDirect Citation Index: 94, 2018) and its relatively high number of privacy items.[5] Of all the reviewed scales, this is the only measure that underwent recommended steps of scale development. Overall points of critique include absence of the conceptualisation of privacy, colluded items within the dimension, and inconsistent use of metrics. Veitch et al. did not specifically define the concept of privacy. For the assessment of privacy, items from the Ratings of Environmental Features questionnaire developed by Stokols and Scharf (1990) were used and adapted. One item concerning privacy was added (degree of workstation enclosure). Of the ten items, only three assess privacy directly by asking about the frequency of disruptions, and levels of visual and conversational privacy. While the first item clearly captures input controls, the last item (conversational piracy) is unspecified and could relate equally to input and output control. The previously mentioned critique on using unspecified items applies. Although not specified as a privacy issue, two items on noise theoretically capture control of indirect acoustical input from others. The remaining five items address context factors correlating with privacy (enclosure, distance of desk, size of desk, adaptability of work area/personalisation, and aesthetics). Although the items refer to a variety of metrics (frequencies, degrees, amount,

[5] Other measures that observe building quality and address privacy (e.g. Dillon & Vischer, 1987 in Veitch et al., 2007; Stokols & Scharf, 1990) have been excluded from the review as they had similar shortcomings to the reviewed scales.

distance, size, and ability), all are assessed on a seven-point satisfaction scale. This approach is not in line with construct equivalence, as phrasing of the items should match the metric used (e.g. Hussong et al., 2013).

3.3.1.9 Privacy by Rashid et al. (2009)

Rashid and colleagues developed a six-item measure of privacy using a five-point Likert scale assessing agreement. Overall points of critique include a lack of conceptualisation of privacy, incomplete representation of the concept by items, and poorly constructed items (e.g. double-barrel item). They do not specify their understanding of privacy and the basis of the constructed items in depth, nor do they draw on previous conceptualisations of privacy from other scholars. They distinguish between visual and auditory privacy, which forms an overall sense of perceived privacy. Visual privacy seems to be altered by accessibility and visibility. However, it is not explained what acoustic/auditory privacy constitutes. Auditory privacy is assessed by two items referring to output control ("co-workers cannot hear my telephone conversations"). However, auditory input control (e.g. noise from others) is not assessed. It is unclear why the two auditory control items refer to the extreme case of no one being able to hear any conversations. This seems unlikely in an office setting. Further, it contradicts the understanding of privacy needs being dynamic (Altman, 1975) rather than being constant and uniformly high. Visual privacy is assessed by only one unspecified, double-barrel item: "I do not mind visual/physical control by supervisors". Whilst the item refers on the one hand to panoptic control of supervisors, it also refers to physical control by supervisors. It is unclear why the item refers to supervisors rather than the overall social environment. Further, physical control by colleagues and supervisors seems inappropriate in any work context and violates employee rights in most countries. Other forms of visual output controls (e.g. task confidentiality) or visual input controls (e.g. others passing by) were not assessed. Similarly, input controls by interruptions

were not assessed, although the definition refers to accessibility of oneself to others. The remaining items assess a correlate of privacy (adjustability of workspace) and general privacy. Previous comments about the use of correlates and general items for the assessments apply.

3.3.1.10 Noise distraction and privacy by Candido et al. (2016)

Candido et al. (2016) developed an Occupant Indoor Environmental Quality (IEQ) post-occupancy survey called BOSSA (Building Occupants Survey System Australia) Time-Lapse, which included four items that fall into the previously defined category of privacy. The survey development was part of the BOSSA project, which included "building science researchers at two universities and key stakeholders in Australia's commercial property industry" (p. 215). In 2016, the BOSSA database included 65 buildings that had been surveyed by BOSSA Time-Lapse in Australia's capital cities. The four items assess agreement and satisfaction with sound privacy, visual privacy, interruptions, and noise on a seven-point Likert scale. The latter two items were not officially classified as privacy items but they fit Altman's (1975) understanding of input control regulation. Overall points of critique include absence of a definition, reduced assessment of privacy, and limitations regarding scale construction. Candido et al. (2016) do not specify their understanding of privacy, or the basis of the constructed items, or draw on previous conceptualisations of privacy. They refer to "industry-standard POE questions" (p. 215) and point to the previously reviewed IEQ survey by Zagreus et al. (2004). They distinguish between visual and sound privacy, each assessed by one item. Both refer to output controls. Visual privacy specifies: "[M]y normal work area provides adequate visual privacy (not being seen by others)." Other forms of visual output controls that are specific to a work context (e.g. task confidentiality) were not assessed. Sound privacy specifies: "[M]y normal work area provides adequate sound privacy (not being overheard by others)." Specific forms of auditory output controls

that are specific to a work context (e.g. confidentiality conversations) were not assessed. Visual and auditory input controls are each assessed by one interruption and one noise item. The interruption item specifies: "[T]he work area's layout enables me to work without distraction or unwanted interruptions." It is unclear why the item is limited to environmental conditions enabling input controls. This approach limits the assessment of input controls as various reasons could enable or limit input controls (e.g. social conditions at work). Specific forms of visual input controls that are specific to a work context (e.g. others passing by) or auditory input controls (e.g. being accessed by colleagues) were not assessed. The noise item has a different rating scale to the previous three items. It asks: "Please rate your satisfaction with the overall noise in your normal work area." The four items are assessed on differed metrics (agreement and satisfaction scales) and would not be able to build an aggregated score as this would violate construct equivalence (e.g. Hussong et al., 2013). Subsequent papers by the authors suggest that the four items are used as individual scales assessing each dimension of privacy separately. This use of single-item scales is not without limitations, as measures ought to capture the full range of attributes of the phenomenon under investigation by the number of items (Lohr, 2002).

3.3.1.11 Need-For-Privacy (NFP) scale by Haans et al. (2007)

Haans et al. (2007) developed a 25-item behaviour-based measure of privacy needs in office environments, called NFP. A five-point frequency scale is used to assess how often privacy regulating behaviour was used. Overall points of critique include an inappropriate theoretical base of the measure, few rational to justify individual items, and a high number of items. Haans et al. (2007) based their initial understanding of privacy on Altman's framework, but operationalised the assessment of privacy by employing the Rasch Model (e.g. Bond & Fox, 2001). By taking a Rasch Model approach to measuring privacy, Haans et al. (2007) suggest that the degree of privacy desires can be directly inferred by the frequency

of displayed privacy regulating behaviour. The Rasch Model perspective disagrees fundamentally with Altman's (1975) privacy-fit perspective. Altman argues that privacy desires and actual privacy are two distinct variables, which either match or do not match. If the match is poor then privacy regulating behaviour will be employed (Altman, 1975). The Rasch Model perspective appears to oversimplify this process. This is because the information elicited from recorded behaviour is highly limited. For example, little displayed behaviour might be due to little need for privacy, or to adequate privacy fit (match between actual privacy and desire), or to contextual factors that hinder privacy regulating behaviour, or to other coping mechanisms, such as cognitive coping processes that make regulating behaviour redundant. Further, the measure does not allow examination of the independent influence of individual and contextual factors on privacy needs and privacy fit, which is fundamental to Altman's theory and work privacy research in general. Furthermore, Haans et al. (2007) argue that the measure is superior in that it does not require respondents' introspection into privacy needs. However, it seems that this approach is a limitation for the aforementioned reasons.

In terms of the item pool, the authors do not give a rationale for the 25 items other than a reference to the privacy literature. It is not explored by the authors whether different types of privacy needs could exist (e.g. input and output controls, Altman, 1975) nor whether different privacy behaviours could be matched to different needs. Therefore, the multi-item measure was treated as a unidimensional scale; no factor structure tests were performed. In light of Altman's (1975) cases of input and output control, this approach appears to be an oversimplification of assessing work privacy. In addition, the lack of factor structure testing is not in line with scale development guidelines (e.g. Churchill, 1979). Further, the high number of items appears excessive, which might lead to an increased respondent and administrative burden (e.g. DeVellis, 1991; Lohr, 2002; Spector, 1992).

3.4 Discussion

As the review has shown, collectively, the reviewed measures exhibit a number of shortcomings. Only four of the 11 instruments resulted from systematic measure development (Candido et al., 2016; Haans et al., 2007; Rashid et al., 2009; Veitch et al., 2007; Zagreus et al., 2004). Only three studies gave fully transparent psychometric test results (Candido et al., 2016; Haans et al., 2007; Veitch et al., 2004). However, only two studies assessed factor structure, reliability, and construct validity sufficiently (Haans et al., 2007; Veitch et al., 2004). Most measures have some initial evidence of tested validity, although this is mainly limited to Cronbach's alpha scores. Convergent validity (i.e. environmental features, job type, workspace satisfaction, personality attributes or similar correlating with privacy) and cross-population equivalence (office and/or job types) were assessed in all studies apart from two (O'Neill, 1994; Zalesny & Farace, 1987) but not in the context of psychometric testing but rather for hypotheses testing. Only one instrument was tested for discriminant validity (Haans et al., 2007) and none was tested for temporal stability.

Conceptually, none of the measures takes a consistently transactional approach to privacy. The way most of the instruments are constructed presumes privacy desires to be stable and uniformly high for every worker. This disagrees with Altman's (1975) understanding that desires for privacy are a state largely determined by context factors (e.g. task at work) and hence are dynamic, rather than being a trait of individuals and static. This is particularly evident in the metrics used. Most agreement or accuracy metrics assess the status quo of privacy levels (for example, agreement on whether one can hear colleagues nearby or whether one can talk privately) as opposed to assessing the adequacy of the level of privacy (as done by one study, i.e. Candido et al., 2016). An agreement scale on noise levels or the ability to talk privately implies a constant and statically high desire for quietness and private conversations. The use of a frequency scale could assess the temporary nature of the privacy

requirements and the according privacy fit. Two of the 11 reviewed instruments suggest frequency assessment. One assesses the frequency of privacy regulating behaviour rather than the frequency of privacy fit (Haans et al., 2007) and another only suggests frequency in the wording of one item but ultimately uses a satisfaction scale (Veitch et al., 2004). A satisfaction scale, as well as an adequacy scale (as used by Candido et al., 2016), can indirectly assess transactional privacy fit. However, it only gives limited information on privacy fit (e.g. no information on the variance of privacy requirements, or on the frequency of privacy fit) in a working population. Depending on the research aim, a satisfaction or adequacy scales might not yield enough information for the purpose of the study. Further, not only metrics but also a change in item wording could specify the temporary nature of privacy requirements. For example, the item "I can have a conversation without others hearing me" (Experience of Privacy Measure by Crouch & Nimran, 1989) could specify the temporary nature of privacy desire by adding "…when I need to". However, without using a frequency scale, the information elicited by this item is limited (see previous comment).

Of the 11 reviewed instruments, the ones that come closest to a multidimensional assessment of input and output controls are Sundstrom et al.'s (1982b), Oldham's (1988), Veitch et al.'s (2007), and Candido et al.'s (2016) measures. Although they have limitations as the following sections will show, all four address task privacy/interruptions (input), communication privacy (output), and acoustical stimulation (input).

3.5 Chapter Conclusions

This chapter has reviewed prior measures of work privacy and has highlighted shortcomings of varying degrees, such as absent or poor conceptualisation of privacy, unidimensional assessment, and violation of scale development and testing. This highlights the need to develop a new multidimensional measure of privacy fit, which will be examined in the subsequent empirical chapters of this thesis (Chapters 4–8).

3.6 Structure of the Following Empirical Studies

In what follows, an overview of the subsequent empirical studies and their samples (Figure 1) is given.

Study 1 (Chapter 4)

Title: The Development of the Privacy At Work Inventory (PAW)

Aim: To explore poor privacy fit scenarios to develop a new measure of work privacy

Design: Qualitative

Study 2 (Chapter 5)

Title: Psychometric Evaluation of the Privacy At Work Inventory (PAW)

Aim: To psychometrically test the new measure of work privacy

Design: Cross-sectional

Study 3 (Chapter 6)

Title: Poor Privacy Fit at Work – How it is Associated with Stress, Dissatisfaction, and Fatigue & How Context Factors Can Help

Aim: To assess the relationships between privacy fit, coping appraisal, stress-related consequences at work, and context factors

Design: Cross-sectional

Study 4 (Chapter 7)

Title: A Longitudinal Study to Assess Whether Changes in Work Environment Predict Changes in Privacy Appraisal and Associated Outcomes

Aim: To assess whether changes in context variables lead to changes in privacy fit, coping appraisal, and work-related consequences

Design: Longitudinal

Study 5 (Chapter 8)

Title: The Same Environment But Different Privacy Experiences: Exploring the Impact of Contextual Factors on Privacy Fit in an ABW Office

Aim: To exploring context variables in an ABW environment that are associated with supporting or hindering privacy regulation

Design: Qualitative

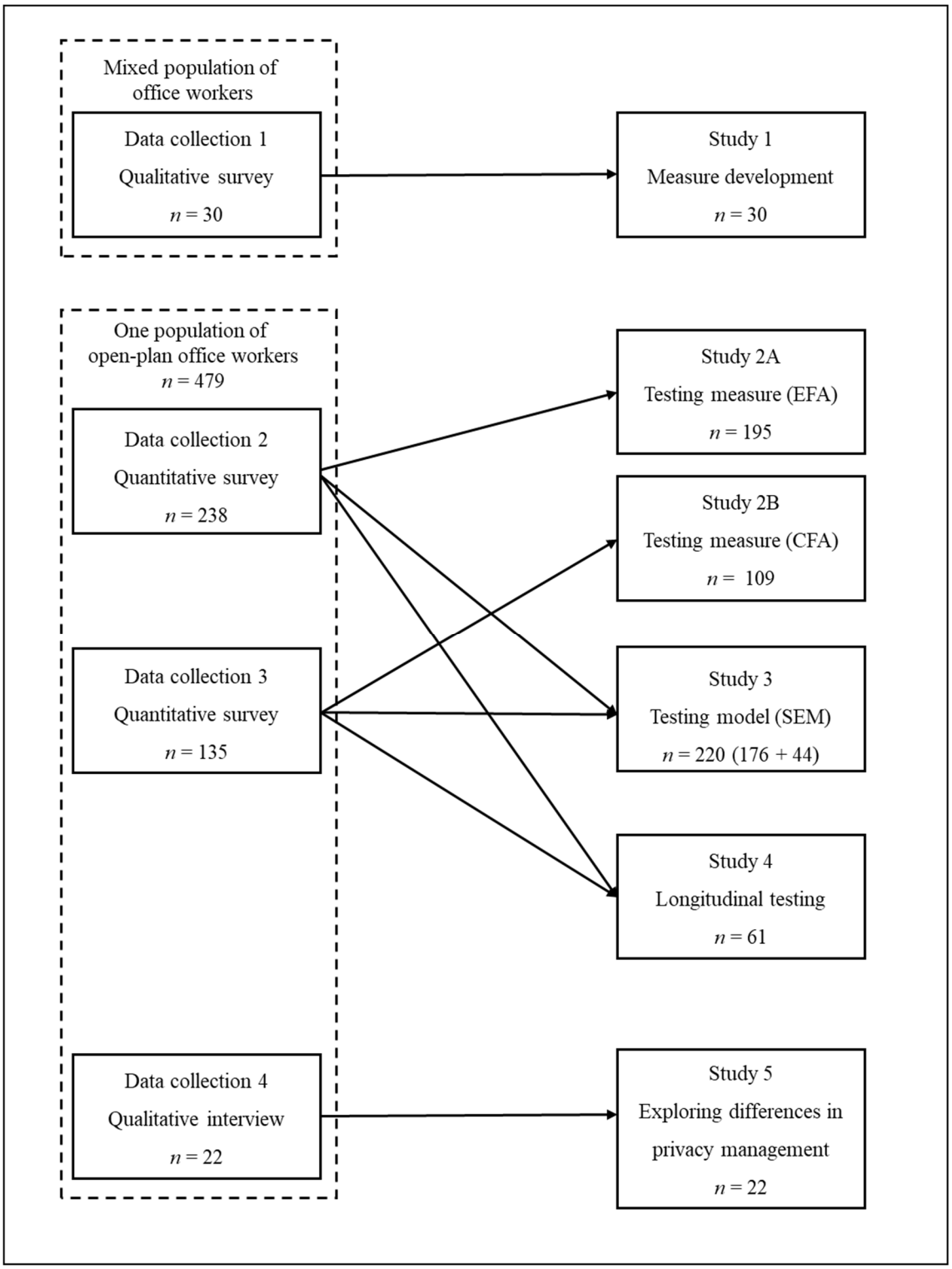


Figure 1. Flow chart to demonstrate data collection and sample splitting.

4 Chapter Four:

Study 1 — The Development of the Privacy At Work Inventory (PAW)

4.1 Abstract

Many prior conceptual definitions and measures of work privacy have been inadequate in a number of ways. The goals of the present study were to introduce a work privacy definition based on Altman's (1975) privacy regulation framework, outline the desirable characteristics of a privacy measure, and develop a new set of items and instructions for a privacy at work measure based on Altman's theory. To do so, a collection of qualitative survey data of workers (n = 30) occupying varying types of offices was used to systematically develop an item pool and instructions for the multidimensional Privacy At Work (PAW) measure. In accordance with the conceptual framework, three dimensions were identified that related either to input controls or output controls of stimuli and information at work. These dimensions are acoustical and visual stimulation, interruptions, and confidentiality. Unlike any previous work privacy measure and true to Altman's transactional understanding of privacy, the developed measure assesses the frequency of privacy fit, constituting the relative match between one's privacy desires and the fulfilment of such. Further tests on factor structure and psychometric properties follow in Study 2.

4.2 Introduction

An examination of prior measures suggests that a practical need exists for a new multidimensional measure of privacy at work. Therefore, the multidimensional Privacy At Work Inventory (PAW) was developed in this study and tested in Study 2, following several steps and practices for scale development and evaluation derived from a variety of sources (e.g. Churchill, 1979; DeVellis, 1991; Edwards & Shipp, 2007; Hinkin, 1998; Hussong et al., 2013; Ping, 2004).

4.2.1 Privacy Conceptualisations

As Chapter 1 highlighted, theoretical perspectives on privacy vary greatly and there is no agreement on what privacy actually is (Newell, 1995). Most privacy definitions describe an interactional condition between the person and the environment but have different foci. The focus is either on the person (e.g. when privacy is seen as a state of the person), on the environment (e.g. when privacy is defined as quality of space), or on the person-environment interaction (e.g. when privacy is concerned with a transactional person-environment fit; cf. Newell, 1995). Despite the variety of definitions, two central themes are emerging. The first is a form of input control of stimuli: this is the personal control of regulating others' access to oneself (e.g. Altman, 1975; Bates, 1964; Beardsley, 1971; Ittelson et al., 1970; Kupritz, 2000; Marshall, 1972; Sundstrom, 1986). The second is a form of output control over personal information of varying degrees (Beardsley, 1971; Greenawalt, 1971; Justa & Golan, 1977; Kelvin, 1973; Margulis, 1977; Shils, 1966; Westin, 1970). This matches the most widely accepted transactional definition of privacy formulated by Altman (1975, 1976, 1977). For the purpose of the present research, Altman's framework will be used. As for its transactional perspective, it appears to be the most useful theory to explore the aims of the present research.

Altman (1975) defines privacy as "selective control of access to the self or to one's group … an input and output control process; people and groups attempt to regulate contacts coming *from* others and output they make *to* others" (pp. 11, 18). His framework has six specifications to privacy that in this particular composition are unique to his theory. (1) He differentiates between a person's desired level of privacy and a person's achieved levels of privacy. (2) How well levels of desired and achieved privacy match is described by their level congruency or fit, similar to person-environment fit theory (Edwards et al., 1998). (3) He theorises cases of having too much privacy (if achieved privacy > desired privacy) and cases of having too little privacy (if achieved privacy < desired privacy). (4) In line with his definition, he further compartmentalises desired and achieved privacy into levels of input and output that people desire or can achieve. (5) He defines privacy regulation as an optimisation process as people attempt to achieve the optimal fit between desired and actual privacy at any moment in time. An unsuccessful privacy regulation system ought to lead to the experience of stress. (6) He suggests that privacy needs are dynamic as they change throughout the course of the day influenced by personal (e.g. mood), interpersonal (e.g. closeness to others), and situational (e.g. work task) factors. Altman constructed four cases of good privacy fit (adequate high or low levels of input from or output to others) and four cases of poor privacy fit. Two of the four poor-fit cases fall into the category of having too little privacy, which is of interest to this study. The first describes a case when there is more input from others than desired and the second describes when there is more output to others than desired.

4.2.2 Work Privacy Conceptualisations

A review of prior work privacy definitions indicated great variation in depth and conceptual rigour. Most draw on a limited number of types of privacy, which are not developed along a conceptual framework. Therefore, there is great inconsistency among work privacy conceptualisations. For example, sometimes work privacy refers to speech privacy

(others overhearing conversation, e.g. Cavanaugh et al., 1962), visual privacy (sometimes refers to surveillance, sometimes to limited visual input, e.g. Sundstrom, 1986), acoustical privacy (speech privacy and isolation from intruding sounds, e.g. Zagreus et al., 2004), or task privacy (general distractions and interruptions, e.g. Oldham, 1988), or a combination of these. Kupritz (2000) proposed a multidimensional definition of work privacy, which so far seems to be the most coherent in its conceptualisation. However, it is conceptually close to Altman's framework (1975) and has some limitations. Hence, it is postulated that Altman's framework is preferable.

Altman has not transferred his framework to a specific context. However, as the framework is constructed coherently, a context-specific transferral to the work environment should not pose any concern. The following definition of work privacy is used in this thesis: *Work privacy is a control process of input and output of information in the work environment*. Workers attempt to regulate contacts and stimuli coming from their colleagues and output they make to their colleagues. They strive to achieve the best possible fit between their actual and desired levels of input and output at work. The definition describes the selective control of access to oneself; it understands privacy as a bidirectional process – including inputs from others to the self and outputs from the self to others; and it includes selective control or an active dynamic process in which privacy can change over time and with different circumstances.

4.2.3 Previous Work Privacy Measures

A review on prior work privacy measures, presented in Chapter 3, showed that several instruments exist that assess work privacy, or some aspect of it. However, the development of a quantitative measure based on Altman's framework is rare (Haans et al., 2007). Although previous measures do not appear to have been developed to provide a multidimensional and transactional assessment of work privacy, as defined earlier, it is useful nonetheless to

determine the extent to which their underlying conceptual definitions and items represent work privacy or input and output controls at work. Collectively, these measures exhibit a number of shortcomings. First, some measures appear to have been developed in the absence of a conceptual definition, and where a definition existed, it may not have actually resulted in items matching the definition. Second, an evaluation of items of each measure showed that half of the measures contain items representing constructs other than work privacy, such as outcomes (lack of concentration or irritation) or correlates (adjustability of desk). Third, some measures that purportedly assess a specific type of work privacy (e.g. sound privacy, visual privacy as in Zagreus et al., 2004) assess overall privacy instead. This is done by using one item on general privacy without further explanation of what general privacy means. This is not advised, as Nunnally (1967) pointed out that the process of measurement should involve measuring the attributes of objects and not the objects themselves. Furthermore, asking an unspecified item (e.g. satisfaction with visual privacy) poses a risk of high interpretational variance and error. Fourth, a third of the measures have flaws in their item construction as they include double-barrel questions (e.g. items pointing to input and output at the same time). Fifth, the majority of measures lack psychometric assessment with the exception of measures by Veitch et al. (2004), Haans et al. (2007), and Candido et al. (2016).

Overall, of the instruments that have been reviewed (see Table 1 in Chapter 3), the ones that come closest to a multidimensional assessment of input and output controls are Sundstrom et al.'s (1982b), Oldham's (1988), Veitch et al.'s (2004), and Candido et al.'s (2016) measures. Although these measures have limitations (see Chapter 3), they address some elements of input controls (interruptions [all four measures]; acoustical stimulation [Veitch et al., 2004; Candido et al., 2016]), and some elements of output controls (speech privacy [all four measures], and being overseen [Veitch et al., 2004; Candido et al., 2016]).

4.2.4 Desirable Characteristics in a Work Privacy Fit Measure

Based on the previous discussion, a measure of privacy fit should be context specific and multidimensional, and should assess types of privacy separately (input and output cases), and reflect the transactional nature of Altman's (1975) framework. The last point refers to three transactional characteristics in the assessment: (1) the level of desire and achievement of privacy in capturing individuals' unique privacy requirements and experiences; (2) the level of fit between the two in evaluating the relative impact of the different privacy types by participant; (3) the level of frequency of both in capturing their dynamic nature.

In line with Altman's (1975) understanding of privacy regulation scenarios, the items for each type of work privacy need to assess either a form of input control or a form of output control. To the extent that a measure is multidimensional and assesses frequency of fit, it can be anticipated that researchers will be interested in five types of comparisons. One type is comparing the levels of different types of privacy desires within a group of workers or the levels of the same type of privacy desire across groups of workers. The second type is comparing the levels of different types of privacy fit within a group of workers or the levels of the same type of privacy fit across groups of workers. The third and fourth types of comparison involve the frequency of privacy desire and privacy fit as an outcome. It might be useful to compare the strength of relations involving a specific predictor to the different types of work privacy needs and work privacy fit to guide improvements in work environments. The fifth type of comparison involves the frequency of privacy fit as a predictor or cause. In this case, it might be informative to compare the strength of relations between the overall fit as well as different types of privacy fit and work-related outcomes. For the best interpretable comparisons of work privacy desire and fit types, a commensuration of the types' measure is required. Commensurate measures require conceptual equivalence and metric equivalence, according to literature on integrative data analysis (e.g. Hussong et al., 2013) and person-

environment fit (Edwards & Shipp, 2007). Conceptual equivalence refers to the comparability of items constructed from each measure; items should have the same quantity, the same conceptual meaning, and the same style of wording. Metric equivalence requires all measures to have the same response scale.

4.3 Study Aim

The aim of Study 1 was to develop work privacy items and instructions for a conceptual and systematic multidimensional measure of privacy at work. To do so, a new set of items and instructions for a privacy at work measure is developed based on the work privacy literature and on a semi-deductive thematic analysis of qualitative data collected for this purpose.

4.4 Method

A qualitative online study was conducted for item generation, and examination of overlap of items and dimensions. Findings were analysed using a semi-deductive approach to item and instruction development for alignment of the new measure with Altman's (1975) theoretical framework.

4.4.1 Recruitment

To increase the variety of sample characteristics, an exponential non-discriminative snowball sample of 30 office workers across office types, organisations, job types, and job levels in the UK was used. The snowball sample started with an individual that was the recruitment contact at an organisation surveyed in subsequent studies (2, 3, 4, and 5). Survey participants were asked to distribute the questionnaire via email to any individual they knew who worked in an office environment. Data collection ended after three weeks. For reimbursement purposes, a five-pound voucher for a coffee shop chain was offered if participants left their email address in a separate part of the survey. Participants were

informed that their email address would be stored separately to their survey responses and would be deleted after the voucher distribution. They were also informed that their responses were anonymous and confidential, and would not be made available to organisations' personnel at any time. In terms of ethical considerations, based on the completed "'Self-Assessment Form: Ethics", the submission of a full application to the University Ethics Committee was not required.

4.4.2 Participants

The sample comprised 30 workers of whom 16 were female, 11 male, and there were three individuals who abstained from responding. Participants' mean age was 30 (range 23–61 years, *SD* = 8.3) and the mean years of tenure was 4.4 (range 0.3–30 years). As for the organisations, 24 participants worked in private firms, four worked in either public sector or charitable organisations, and two did not give any details. Participants occupied primarily open-plan offices. When in the office, 15 participants worked at their own desk in an open-plan office (> six occupants), 11 participants worked at a shared their desk in an open-plan office (> six occupants), three participants worked at their own desk in a multi-person office (between three and six occupants), and one participant did not answer the question. None of the participants occupied a single-person office or used a desk in a two-person office. In terms of job levels, seven participants were classified as graduates, 14 as professionals, eight as seniors/managers, and one did not answer the question.

4.4.3 Measure

The questionnaire had three parts: Part 1 asked participants to describe a scenario of poor privacy fit, Part 2 had open-ended and rating questions relating to the scenario in Part 1, and Part 3 asked demographic questions. Part 2 will not be covered in this study as it was designed to examine the type and extent of work task obstruction due to poor privacy fit and

the type and extent of emotional responses to poor privacy fit (see Appendix A for questionnaire) which is not of interest to this study.

In Part 1 of the questionnaire, participants were asked to recall a scenario that is aligned to Altman's (1975) description of having "too much contact" (p. 26) or too much privacy. The approach to use a scenario to elicit an emotional response is in line with the retrieval hypothesis (e.g. Hosany & Gilbert, 2010; Solomon, Bamossy, & Askegaard, 1999).[6] The scenario read: "*Please take a few moments to think of an occasion at work when you were trying to complete a task but you had more contact or interaction with your co-workers than you wanted or needed at that particular moment. The contact may have been work related or non-work related, and may have been face-to-face or virtual.*[7] *Please choose a situation that took place in your current job and anytime between now and the beginning of the year (January 4th, 2016).*" Participants were asked to describe the recalled event in as much detail as possible. To encourage reasonably accurate recall, several stimulating questions about the scenario (e.g. the frequency of occurrence, emotional impact, task completion impact, and what they would have liked to have changed if possible)[8] followed the scenario. This self-reporting technique was used to elicit respondents' experience as it provides an effective method of assessment (Parrott & Hertel, 1999).

In Part 3, participants were asked to provide information about their gender, age, tenure with current employer, job level (five categories ranging from "junior or graduate position" to "associate, director, or partner"), and type of office and desk arrangement and desk sharing

[6] The questionnaire included a second scenario of having too much privacy, which is in line with Altman's framework (1975). As the subsequent studies focus on the measurement and the effects of having too little privacy, the second scenario and its results are not presented in this study.

[7] At the beginning of the study, the aim was to include virtual input and output control as of its prevalence in modern ways of collaboration. However, as the study did not elicit any particular pattern towards virtual privacy regulation, it was decided to phrase some items in a general way that could possibly include virtual privacy regulation without emphasising it (e.g. some items of the dimension visual and acoustical stimulation, and of the dimension interruptions).

[8] As mentioned above, Part 2 of the survey included rating questions on the frequency of such scenarios, two rating questions on how much the scenario affected participants' emotions and tasks, and two open questions on how it affected their feelings and work task. Results to these questions are not presented in this study.

(five categories ranging from “own desk in open-plan office with > 6 occupants” to “single-person office”).

4.4.4 Analysis & Item Development: A Semi-Deductive Approach to Thematic Analysis

The method of analysis chosen for this study was thematic analysis. Thematic analysis was considered to be particularly useful for the item development as it has been described as a “form of pattern recognition within the data” (Fereday & Muir-Cochrane, 2006, p. 82) where emerging themes that are important to the description of the phenomenon under investigation become the categories for analysis (Daly et al., 1997; Braun & Clark, 2006).

Specifically in this study, the approach to thematic analysis was semi-deductive, as it combined a data-driven inductive approach (e.g. Boyatzis, 1998) and a deductive a priori template of themes approach (e.g. Crabtree & Miller, 1999). This approach to thematic analysis has been reported to be useful in qualitative research in general (Fereday & Muir-Cochrane, 2006; Ligurgo et al., 2018; Webb et al., 2011) and specifically in scale development (e.g. Hinkin, 1998), provided a strong conceptual definition of the phenomenon under investigation is at hand (Hinkin, 1998). As Altman’s (1975) privacy regulation framework can be described as conceptually strong, a semi-deductive approach was considered appropriate in which item generation for work privacy relied on a data-driven inductive approach whereas dimensional composition and item categorisation to the dimensions was made deductively following Altman’s (1975) framework and dimensional composition of previous work privacy measures. This semi-deductive approach complemented the research aim by allowing the principles of Altman’s privacy regulation framework to be integral to the process of deductive thematic analysis while allowing work privacy specific themes to emerge from the data using inductive coding.

The coding process followed Brown and Clark's six-step framework as it has been described as one of the most systematic and influential coding approaches to thematic analysis in the social sciences (e.g. Maguire & Delahunt, 2017).

The first step was to familiarize oneself with the qualitative data which including reading and re-reading the entire body of data. This step also included taking notes of early ideas, which were deductively informed.

The second step was to generate initial codes of features of the data, which could represent different nuances of work privacy systematically across the entire data set. This coding process had two phases. The first phase was to develop codes using a data-lead inductive coding approach. Codes were considered adequate when they captured "the qualitative richness of the phenomenon" under investigation (Fereday & Muir-Cochrane, 2006, p. 83). The second phase used a deductive theory-informed approach to refine the codes (e.g. Crabtree & Miller, 1999). Initial inductive codes were cross-referenced with Altman's classification of input and output controls of information and social stimuli. Some initial codes were adapted or excluded in the second phase. Example data for each of the codes was collated.

The third step was to search for themes in the initial codes, which can be described as a deductive scan. This process had two phases. The first phase was to cluster each code according to the deductive a priori template based on Altman's (1975) categories of a) input controls of information and social stimuli or into b) output controls of information. The second phase was to collate codes within each of the two master themes (input vs. output control) into potential subthemes of which each describes a distinct type of work privacy.

The fourth step was to review and revise the subthemes (types of work privacy) by checking if they represent the extracted codes adequately, if they match Altman's

conceptualisation and if any significant work privacy type that has been assessed in previous work privacy measure and might fit to Altman's (1975) conceptualisation was missing.

The fifth steps was to define and name the themes (types of work privacy). This involved an ongoing iterative analysis of the themes by relating them back to Altman's (1975) framework and to dimensions of prior measures, and adjusting them until the author was satisfied that themes were adequate. Based on this step, definitions of and names for each theme as well as a table of themes and codes could be created.

The sixth steps was to frame the items based on the codes and to formulate the instruction. In line with modern test theory, the aim was for each item to reflect a different level of the trait under investigation rather than items reflecting the underlying level of the trait (Nunnally & Berstein, 1994). This means that the aim was to develop a set of items that tap into each nuance of the types of work privacy. Items were included with slightly different shades of meaning, as it is known that seemingly identical statements can produce widely different answers (Churchill, 1979). In writing up the items, conventional guidelines regarding clarity, length, directionality, lack of ambiguity, and avoidance of jargon were followed (e.g. DeVellis, 1991; Spector, 1992). It was the aim that instructions and items had a high level of fidelity to the proposed definitions and that they correspond to the desirable measurement characteristics identified earlier. Based on this step, an initial set of items and instructions was created.

Although presented as a linear, step-by-step procedure, the analysis conducted during each step was an iterative and reflexive process. Several iterative cycles of revisions at each step occurred until both the author and the supervisor were satisfied that codes, themes, items and instructions were adequate and ready for subsequent analysis.

4.5 Results

Three main themes or types of privacy have been identified from the qualitative data. The three themes or types of privacy are in line with Altman's (1975) framework as they represent input and output controls. The input dimensions are "acoustical and visual stimulation" and "interruptions" while the output dimension is "confidentiality". Taking into account the multidimensionality of the overall measure, it was desirable that the number of items developed for each type of work privacy adequately captured the theme identified in the qualitative data but that the total number of items was not excessive to prevent respondent and administrative burden (Lohr, 2002). Therefore, 17 items were developed – four to seven items for each type of work privacy.[9] Following, each theme or type of privacy is presented with its qualitative evidence followed by its items.

4.5.1 Privacy Type 1: Acoustical and Visual Stimulation

4.5.1.1 Qualitative Data

The first theme is acoustical and visual stimulation, which captures any indirect social input that workers are exposed to and would like to reduce. Of the 30 participants, eight described this theme as their scenario of poor privacy fit. Seven participants mentioned acoustical inputs such as noise from colleagues and four participants referred to visual inputs such as colleagues passing by. For example,

> "(Task) requires concentration, conversations where happening …across the room…there is a lot happening visually and verbally…I have to try (to) block out all of this" (No. 14).

[9] A fourth dimension, "anonymity", and a fifth dimension, *"*solitude*"*, were excluded from further analysis as it was subsequently decided that they did not fit Altman's (1975) theoretical framework well enough. They stem from a different theoretical framework (Westin, 1970) and represent solutions to achieving the states that the three previous dimensions describe. For example, Anonymity enables limited interruptions while Solitude serves to cancel acoustical/visual stimulation and interruptions and maximises visual/acoustical confidentiality. See Tables B.1 and B.2 Appendix B for the items of the two excluded dimensions.

Within this theme, two subthemes have been identified. The first subtheme is the desire for (1) an atmospheric quality of quietness (referring to acoustical inputs) and calmness (referring to visual inputs), as stressed by four participants. For example, participant No. 14 above and No. 30 highlighted their desire for a calm atmosphere:

> "I … needed to concentrate … the atmosphere in the office was high energy… lots of things happening around you … I was constantly distracted" (No. 30).

Also, the quote by participant No. 25 stressed his/her desire for a quiet atmosphere:

> "[T]here were people around me that had calls at their desks, were discussing project-related stuff across the desks, so the environment was quite noisy. Not the type of environment I can concentrate in… there wasn't a space in the office where I could go and it would be quiet – like at university in the library – people are there to do self-study and read and everyone's aware of that and it is quiet. A library-type space would be great – quiet and people should know if they go there they need to be quiet (No. 25)."

The second subtheme refers to (2) indirect social acoustical and visual inputs that are experienced as distractions. This subtheme was expressed in general terms and in time or task specific terms. As for general distractions, participant No. 18 points to general distractions that occur spontaneously:

> "Impromptu meetings are great in open-plan offices when you are in them, however other people can be loud and distracting" (No. 18).

As for time and task specific distractions, participants stressed that they required limited indirect social inputs for the duration of completing a task, or when having a phone call. For example, participant No. 30 explains:

> "I was writing a proposal and … the deadline was approaching. I was … distracted by conversations around me – e.g. people are talking about things that are relevant to you" (No. 30).

4.5.1.2 Item Generation

As shown in Table 2, seven items were developed for the first dimension acoustical and visual stimulation. Of these seven items, four items refer to acoustical indirect social inputs and three items refer to visual indirect social inputs. This dimension is in line with Altman's (1975) theory and matches his description of one case of poor privacy fit when inputs from others are desired to be minimised (see Chapter 1 for details). In accordance with the subtheme (1) atmospheric quality of quietness and calmness, it was decided that two items should represent a broader concept of working in a quiet or visually calm environment by following a scenario format and using some of the participants' wording (items No. 1 and 2). In line with the subtheme (2) acoustical and visual distractions, two items were developed that address any form of acoustical or visual distractions (items No. 3 and 4) mentioned by the participants (e.g. impromptu meetings, conversations across the room, calls at desks). The phrasing and construction of the two items is similar to items used in prior work privacy measures (e.g. "working without visual or acoustic distractions" by Keeling et al., 2015, p. 886). In line with the finding that visual and acoustical distractions are particularly impactful during task completion, three items were developed that addressed distractions that occur during a specific task (having a phone call; item No. 7) or during a long period of one hour or more at a time while completing a task (items No. 5 and 6). The reference to a time specific period has been used before in prioir measures of work privacy (e.g. "I can work uninterrupted for long periods" by Sundstrom et al., 1982b).

Table 2

Items and instruction dimension 1 – Acoustical and visual stimulation (Study 1)

		In the last 4 weeks, I wanted or needed to ...	In the office, I was able to…
		(1) Never – (7) All the time	(1) Never – (7) All the time
1	… be in a quiet environment with not much noise from others around me		
2	... be in a "visually calm" environment with not much happening around me		
3	... work with no visual distractions around me		
4	... work with no acoustical distractions around me		
5	... work without noise distractions for a long period of one hour or more at a time		
6	... work without visual distractions for a long period of one hour or more at a time		
7	…have minimal acoustical distractions from others around me when having a phone call		

4.5.2 Privacy Type 2: Interruptions

4.5.2.1 Qualitative Data

The second theme is interruptions, which captures any direct input that workers are exposed to and would like to reduce. Of the 30 participants, 20 described this theme as their scenario of poor privacy fit. Within this theme, two subthemes have been identified. The first subtheme is (1) accessibility to others characterised by colleagues asking a large number of questions or doing so with poor timing. Fourteen participants mentioned increased accessibility and interruptions by others' questions as their poor privacy fit scenario. This subtheme encompasses interruptions that were described in a general context and interruptions that occur over a task-specific period. The following three quotes highlight participants' experience with general distractions and distractions specifically during task completion:

> "I am interrupted very often at work but … the interruptions are generally part of my job" (No. 20).

> "They came with queries throughout the day and so I had to complete the task at three … in the morning to meet the deadline. While the queries were legitimate and important to the project, had I not been in the office they would probably have been condensed into a brief email exchange" (No. 8).

> "I was preparing information for an internal review … and I received multiple requests … from a colleague ... The information requested was readily available … but under stress his easiest and therefore preferred option was to constantly ask me in person. While normally this is more tolerable when I am also under time pressure … and clearly trying to concentrate (headphones on) it became very distracting and frustrating. I would have encouraged my colleague to search for the information himself. This, however, is something of a social faux pas in that you are always expected to help a colleague when asked – and asking in person implies the matter is urgent and would require immediate attention" (No. 3).

The second subtheme is (2) sociability, which was stressed by five participants. It addresses situations in which one is interrupted not by being asked work-related questions but by personal questions, which implied a social pressure to interact with colleagues. For example, participant No. 1 stressed the latter:

> "Trying to finish a task late in the day, and someone else's lack of focus leads to chatter around you, which you feel obliged to participate in" (No. 1).

4.5.2.2 Item Generation

As shown in Table 3, four items were developed for the second dimension, interruptions. These four items reflect the different aspects of interruptions elicited by the data. This dimension is in line with Altman's (1975) theory and matches his description of a case of poor privacy fit when inputs from others are desired to be minimised and one experiences intrusion (see Chapter 1 for details). In accordance with the overall nature of the subtheme (1) accessibility to others, item No. 3 refers to the desire to be less accessible than usual. The purpose of this item is related to items of previous work privacy scales (e.g. "How often do you try to shut off or get away from your colleagues at work?" by Keeling et al., 2015, p. 886). Further, item No. 1 refers to the desire to work uninterrupted by queries from

co-workers which is regularly assessed in other work privacy scales (e.g. “Frequency of distractions from other people” by Veitch et al., 2007; “Interruptions at work often prevent me from giving my full attention to my job” by Oldham, 1988). In accordance with the subtheme (2) sociability, item No. 4 refers to the social pressure to interact when colleagues involve one in a conversation. Item No. 2 refers to both subthemes (being asked work-related or personal information) and has a time-specific focus. A time or task-specific focus in this context was used before in prior work privacy scales (“How often are you interrupted when you have little time to complete an important task” by Seddigh et al., 2014).

Table 3

Items and instruction dimension 2 – Interruptions (Study 1)

		In the last 4 weeks, I wanted or needed to ...	In the office, I was able to…
		(1) Never – (7) All the time	(1) Never – (7) All the time
1	... work uninterrupted by queries from my co-workers		
2	... work for a long period of one hour or more at a time without being asked for personal or work-related information		
3	… be less accessible to my co-workers than I usually am		
4	... work without socially engaging with anyone around me		

4.5.3 Privacy Type 3: Confidentiality

4.5.3.1 Qualitative Data

The third main theme is confidentiality, which captures any output that workers do not want to give to others around them. The data reveal a particular desire for acoustical confidentiality as highlighted by participant No. 1:

> “The open-plan environment makes you wary about everything you say, …everyone seems to listen in, so these situations make me… hesitant to stand up and say something to a co-worker” (No. 1).

4.5.3.2 Item Generation

The dimension confidentiality is in line with Altman's theory and reflects the case when outputs to others are desired to be minimised. As shown in Table 4, six items were developed for this dimension. Of these six items, three items assess acoustical output that one seeks to keep confidential and three items assess visual output that one seeks to keep confidential.[10] Although the data emphasizes the need for acoustical output controls, in accordance with previous measures (e.g. Keeling et al., 2015; Veitch et al., 2007; Zalesny et al., 1987) it was decided to focus on both, acoustical as well as visual output controls.

The acoustical confidentiality items cover confidential (item No. 3) and non-confidential (item No. 2) conversations face-to-face or via the phone and use a wording that was employed by participant No. 1, "others listening in". Confidential conversations (item No. 3) were considered as important to the assessment of work privacy due to the context of being a work. This consideration was affirmed by the fact that the assessment of confidential conversations is a regularly part of work privacy scales (e.g. Keeling et al., 2015; Oldham, 1988; Sundstrom et al., 1982b; Zalesny et al., 1987). The final acoustical confidentiality item (No. 1), "…have conversations with my co-workers or phone calls without distracting others", was informed by Oldham's (1988) and Sundstrom et al.'s (1982b) speech privacy dimension. Although not present in the data, it is a unique item that no other scale included. It was of interest if the subsequent factor analysis (Study 2) reveals whether this item is part of confidentiality construct.

Considering the data at hand and the construction of previous work privacy scales, it is suggested that acoustical confidentiality should touch on work-related and private

[10] Two items were excluded from further analysis as it was subsequently decided that they represent group privacy rather than individual privacy, which is a distinctly different concept (Altman, 1975). These items read: "... work with co-worker(s) somewhere physically separated from other groups" and "... have private teamwork sessions removed from other groups".

conversations. In order to gain conceptual equivalence in the dimension, it was decided to develop three visual confidentiality items to match the three acoustical confidentiality items. In line with previous measures (e.g. “being able to work with confidential documents” by Keeling et al., 2015) and in line with the outlined privacy conceptualisation (Altman, 1975), the three visual confidentiality items (4, 5, and 6) focus on task privacy rather than a general notion of being seen and/or observed (as e.g. “visual privacy” by Kim & de Dear, 2013).

Table 4

Items and instruction dimension 3 – Confidentiality (Study 1)

		In the last 4 weeks, I wanted or needed to ...	In the office, I was able to…
		(1) Never – (7) All the time	(1) Never – (7) All the time
1	… have conversations with my co-workers or phone calls without distracting others		
2	... have non-confidential conversations with my co-workers without others listening in		
3	... have confidential conversations with my co-workers or phone calls without others listening in		
4	... work where I can keep what I am working on confidential		
5	... work without others seeing what I am working on		
6	... work where I do not feel that others can look over my shoulder		

4.5.4 Instructions for the Scale

Scale development requires not only the formulation of items but also consideration of answer options and instructions. As regards the development of the instructions, three main decisions were made. Firstly, the previously proposed frequency response format was set to a seven-point Likert scale as some evidence suggests that seven-point Likert scales have more scale sensitivity, reliability, validity, and discriminating power than five-point Likert scales (Cummins & Gullone, 2000; Preston & Colman, 2000). Secondly, the retrospective recall period of four weeks was chosen to increase internal validity and reduce measurement error

due to incorrect recall (Stull, Leidy, Parasuraman, & Chassany, 2009). In a sick leave study, Severens, Mulder, Laheij, and Verbeek (2000) found that a recall period of two to four weeks introduces very little error in comparison to two months, six months, and 12 months. Thirdly, it was decided to present the desired frequency scale next to the achieved frequency scale instead of presenting two separate scales to prevent respondent fatigue but also to create a recall context for each item being desired and achieved.

4.6 Discussion

Based on qualitative data, the present study identified three dimensions of work privacy, which related either to input or to output controls of information and stimuli. In contrast to previous measures and their dimensions, this measures systematically assesses input controls and output controls in separate dimensions. The three identified dimensions of work privacy were acoustical and visual stimulation, interruptions, and confidentiality. The first dimension, acoustical and visual stimulation, captures any acoustical and visual input from others that requires control, such as chatter from others or others walking past. This relates to previous measures of acoustical privacy (e.g. Zagreus et al., 2004) or visual privacy (e.g. Zalesny et al., 1987), which can include isolation from intruding sounds or from visual distractions. The second dimension, interruptions, captures any direct social input that requires control, such as others approaching and asking questions. Previous measures rarely acknowledged and assessed individually direct interruptions by colleagues, although the data suggest that it is a crucial element of work privacy. The third dimension, confidentiality, captures output controls of visual and acoustical information that requires control. This includes elements related to task confidentiality and conversation confidentiality. Regularly, prior measures assess speech privacy that refers to having (general or confidential) conversations at work without others overhearing them (e.g. Candido et al., 2016). In contrast, task confidentiality, which appears to be a crucial element of a work privacy scale,

is seldom assessed in other work privacy scales (e.g. exception Keeling et al., 2015). Mostly, visual privacy is assessed unspecified (e.g. O'Neill, 1994; Veitch et al, 2007; Zalesny et al., 1987; or specified in form of surveillance (e.g. Candido et al., 2016; Rashid et al., 2009).

Based on the qualitative results, the present study developed a set of items and instructions for the assessment of multidimensional work privacy. Unlike any previous work privacy measure and true to Altman's transactional understanding of privacy, the resulting item pool assesses the frequency of privacy fit, constituting the relative match between one's privacy desires and the fulfilment of such.

4.7 Limitations

Even though the method of data collection allowed to sample workers of a variety of job roles and types, interviews would have been superior in eliciting information, particularly on the confidentiality privacy theme. Although informed by Altman's (1975) explanation, the phrasing of the scenario ("interaction with your co-workers") seems to have mostly elicited cases of poor privacy fit that fall into the category of input control (acoustical and visual stimulation and interruptions). Interviews would have given the opportunity to encourage further specification or explain any misunderstanding regarding the instructions.

While the nature and size of the sample were adequate for the development analyses undertaken (Churchill, 1979), the sample has limitations. While a useful range of office workers of different job types, grades, and organisations was aimed for the sample is mostly comprised of open-plan office workers. Further, the sample is limited to workers in the UK which comes with certain cultural norms in terms of privacy experience (Altman, 1975) and with certain spatial norms in terms of office design (BCO, 2014). While cross-national analyses should be conducted in the future, in the meantime it is advised that the PAW should only be employed for a UK population. As pointed out by Altman (1975), privacy desires and privacy-related expectations are highly influenced by sociocultural norms.

The desired conceptual equivalence of the measures' privacy dimensions was not fully reached as items differ slightly in their number and their wording. Although aimed for, it was not always possible to construct the wording of the sets of items in such a way that they differed only in reference to a specific privacy type (Hussong et al., 2013). An attempt to do so resulted in the loss of crucial differentiating information on the items.

4.8 Conclusions & Next Steps

It became apparent that diverse, ad hoc, and invalidated measures of work privacy are regularly used and that no systematically validated self-report measure on work privacy has been developed. The present study suggests a multidimensional definition of work privacy and developed a set of items and instructions for the assessment of multidimensional work privacy. The psychometric properties of this preliminary version of the Privacy At Work Inventory (PAW) will be tested subsequently in Study 2.

5 Chapter Five:

Study 2 – Psychometric Evaluation of the Privacy At Work Inventory (PAW)

5.1 Abstract

Although poor work privacy represents a frequently reported issue in open office environments, many prior conceptual definitions and measures have been inadequate in a number of ways. The goal of the present study was to psychometrically evaluate a new measure of privacy fit called The Privacy At Work (PAW) inventory by the means of expert review, EFA, CFA, reliability and validity analyses. Results from a pilot study (n = 14) and two main studies (2.A and 2.B) of UK open-plan office workers (n = 195; n = 109) suggest that PAW is psychometrically sound and evinces meaningful relations with variables known to be associated. The final version of PAW provides separate assessments of four dimensions of privacy. In accordance with the conceptual framework of Altman's (1975) privacy regulation theory, two dimensions specify output control over information, i.e. task privacy and conversation privacy, while two dimensions specify input control over information, i.e. indirect input by visual and acoustical stimulation, and direct input by interruptions. Further, PAW assesses privacy fit scores by means of two frequency scales, which is a new and theory-driven approach to measuring work privacy. Although these first results on psychometrics appear promising, they need to be interpreted with caution due to their rather preliminary nature. More research is required to fully evaluate the utility of PAW in research on work privacy.

5.2 Introduction

An examination of prior measures as presented in Chapter 3 suggests that a practical need exists for a new multidimensional measure of privacy at work that incorporates the desired measurement characteristics outlined in Study 1. Therefore, the multidimensional Privacy At Work Inventory (PAW) was developed in Study 1, following several steps and practices for scale development and evaluation derived from a variety of sources (e.g. Churchill, 1979; DeVellis, 1991; Edwards & Shipp, 2007; Hinkin, 1998; Hussong et al., 2013; Ping, 2004).

5.3 Study Aim

The aim of the present study is to evaluate the newly developed multidimensional privacy at work measure on its psychometric properties. To do so, this study undertook three substudies. Firstly, the item pool and instructions were tested for content and face validity in a pilot study. Secondly, an assessment of the factor structure of the items was undertaken in Part A of this study (2.A). Thirdly, a confirmatory test of the factor structure and other psychometric properties was undertaken in Part B of this study (2.B).

5.4 Pilot Study – Content Adequacy & Face Validity

The content adequacy and face validity study was conducted to determine whether the 17 privacy at work items were conceptually consistent with the relevant definitions of input and output control in Altman's privacy regulation theory (1975) and to determine the clarity and coherence of the wording and response scale.

For content adequacy and face validity evaluations, 14 content and methodological experts with particular insight into the area of workplace consulting, psychology research and scale development were asked to participate in the pilot study. Experts were selected based on accessibility via the author's own and her supervisor's professional network. All 14 experts agreed to participate in the pilot study. Seven of them were methodological experts

working as researchers in the field of environmental, health, or social psychology. The remaining seven participants were content experts working in the field of workplace consulting.

Upon agreement for participation, the experts received a link to the online pilot study. For the pilot study, an approach for content adequacy evaluation was used as suggested by Lawshe (1975). The study started with a set of conceptual definitions for privacy regulation in general, and specifically for the process of controlling inputs and outputs of information at work, according to Altman's framework (1975). Following the definitions, a rating form that provided a column with the 17 privacy at work items in random order was presented. On the rating form, there were three columns. The first column was used to score the frequency that was desired for each item in the last four weeks ("In the last 4 weeks, I wanted or needed to…"). The second column was used to score correspondingly the frequency at which participants managed to work in the condition described by the item ("In this office, I was able to…"). Both frequency ratings were given on a seven-point scale ranging from *1-Never* to *7-All the time*; both rating scales had descriptors for each scale point (*2-Rarely*). The third column was labelled "Is the item 'essential' to the overall question aim based on your experience of wanting or needing more or less contact with co-workers in the workplace" and a three-point scale ranging from "*1-Essential*" to "2-*Useful but not essentia*l", and "*3-Not necessary*" was used. The experts were asked to read the conceptual definitions and then, for each item, score how much the item represented the concept in question and was "essential" to the overall study of the concept of privacy at work. These responses were measured using Lawshe's (1975) content validity ratio (CVR), which represents how often each item is judged to be reflective of, or theoretically linked to, the privacy at work construct. The CVR value ranges from -1 to +1, with values closer to +1 indicating that the respondents agreed that the item is "essential" and, therefore, valid. In addition to this protocol, the respondents

completed a supplemental section that asked them to comment on the wording and ordering of the items as well as on the overall scale format and layout.

The CVR index was .62, and therewith had a CVR value higher than .49 and was retained (following Lawshe's recommendation on the minimum; see Table C.1 in Appendix C for CVR table). Two central points of interest were highlighted in the qualitative comments from the respondents. These comprise the importance of categorising the items according to the hypothesised dimensions, presenting separate scales (by dimension), and the need for a clearer response description and presentation. In light of these suggestions, four decisions were made when refining the proposed instrument. First, the instructions were reworded to achieve more clarity. Wordier but more exact instructions for both scales (desired and achieved/fit) were used. For the desired frequency scale, it was decided to point out that participants should respond by thinking about their standard working situations, which was specified by the addition of "working amongst colleagues in the open-plan office". Hence, the new instruction said "*In the last 4 weeks when working amongst my colleagues in the open-plan office, I wanted to ...*". For the achieved/fit frequency scale, it was decided that instructions should specify situations when participants were able to work in a certain condition at times when they also required to do so (oppose to ask for achievement unrelated to ones requirements). Hence, the instruction for the achievement or fit frequency scale was changed to "*Of the times I wanted to work in this condition in my base office building, I was able to achieve it*". Second, rating point descriptors were used only at the ends of the scales (*1-Never, 7-All the time*). Third, it was decided to revise and group the items according to the four hypothesised dimensions in order to prevent question order bias (Podsakoff et al., 2003). Fourth, the four groups of privacy at work items were treated as separate scales in their own right.

The refined instrument used in the main study therefore consisted of three separate scales with a seven-point frequency response format. The first subscale was named "acoustical and visual distractions" and comprised seven items, while the second subscale consisted of six items and was named "confidentiality". Meanwhile, the third subscale comprised four items and was called "interruptions".

5.5 Study 2.A

The goal of Study 1 was to explore the underlying factor structure of the privacy at work items and test the reliability for subsequent analysis of psychometric properties in Study 2.

5.5.1 Method

5.5.1.1 Study Design & Recruitment

The target population was knowledge workers who occupy a large open-plan office (> 24 persons/room, Danielsson & Bodin, 2008) that uses predominantly desk sharing in the UK. Data was collected via an online survey at a British architecture and engineering company with a total population of approximately 1,000 staff. Staff worked at assigned and shared desks arranged by teams. Some spatial dividers, meeting rooms, and a breakout area were provided. Managers of teams with more than five members were asked to distribute the survey among their team members: a total of n = 479. Eleven managers agreed to distribute the online questionnaire via email. They followed up with three reminders over the data collection period of four weeks. All participants were informed that their responses were anonymous and confidential, and would not be made available to organisations' personnel at any time. An incentive was given by the company of six lottery prizes (value £50). The questionnaire was not only used for the purpose of scale evaluation but also for conceptual privacy appraisal model evaluation (Study 3) and a longitudinal study (Study 4). In terms of ethical considerations, based on the completed "Self-Assessment Form: Ethics" considering

the full questionnaire (as described in Study 3), a submission of a full application to the University Ethics Committee was not required.

5.5.1.2 Sample Size Considerations

Differing views exist on the number of participants required to carry out scale validity testing in general and structural analysis in particular (Mundfrom, Shaw & Ke, 2005). Some scholars recommend a moderately sized sample (e.g. n = 100-200) for initial testing (Clark & Watson, 1995), whereas others postulate the necessity of vast numbers of participants (Comrey & Lee, 1992). Another school of thought is the consideration of the ratio of participants to items oppose to the total sample size. However, there is no agreement between scholars about the optimal ratio (Cattell, 1978). There is evidence, which suggests that the minimum ratio can be as low as 3:1 (three participants per item; Cattell, 1978). Therefore, an exploration of the underlying factor structure of the privacy at work items would require at least 51 participants (17 items multiplied by three).

5.5.1.3 Participants

Out of 479 contacted individuals, 238 respondents submitted valid questionnaire responses. Participants were representative of the organisation regarding age (range: 17–72, $M = 36.6$, $SD = 11.4$), gender ratio (63% male, 36% female, missing $n = 3$), job grade (all grades represented, 9.20% – 17.2%), and department size (ca. 30% of each of the 11 departments took part). As regards to desk status, 56.5% of the respondents worked at an assigned open-plan desk while 42.7% shared their open-plan desk with others.

Missing values were found in 96 of the 238 questionnaires. Individual and aggregated Little's tests (Allison, 2001) on the items suggest that there is no relationship between missing and observed records and that records are missing completely at random rather than missing systematically, $\chi 2$ (377, $n = 238$) = 344.68, $p = .88$. In order to include only responses that have a maximal 5% of missing records on the privacy at work scale (Lowry &

Gaskin, 2014), 43 questionnaire responses were removed for the subsequent analysis. Afterwards, listwise deletion was used for analysis procedures that retained $n = 195$.

5.5.1.4 Measures

The survey instrument contained the 17-item pool to evaluate the frequency of privacy fit at work developed in Study 1 (see Study 3 for the complete survey). Scores of frequency of desired privacy at work were used for the subsequent analyses rather than scores of frequency of achieved privacy at work.[11]

5.5.2 Results

5.5.2.1 Factor Analysis

To explore the underlying factor structure of the privacy at work items and test the reliability in the subsequent analysis, a principle axis exploratory factor analysis (EFA) was performed. EFA was used to explore the factor structure of the item pool and to reduce items, i.e. by identifying items that load highly on multiple factors. Orthogonal (Varimax) rotation was used because medium to high correlations (> .32) between all anticipated factors were not expected (Tabachnick & Fiddell, 2007). To gain the most stable and reliable factor solution obtainable, the following item exclusion criteria were used: inter-item correlation < .40 (Hinkin, 1998), communalities after extraction < .50 (Field, 2005), factor loading < .512 (Stevens, 2002), and any cross-factor loading items (Stevens, 2002). However, as none of the items fell under these scores, no exclusion was undertaken.

The final four-factor solution with 17 items has excellent sample adequacy (Kaiser-Meyer-Olkin .87 > .50; Hutcheson & Sofroniou, 1999), inter-item correlations (Bartlett's test of sphericity, x^2 (136) = 2209.21, $p < .001$; Field, 2005), and adequate total item variance (65% > 60%; Hinkin, 1998). The factor solution can be classified as stable and reliable as it

[11] A factor analysis on the scores of frequency of achieved privacy yielded the same factor structure (see Table C.2 in Appendix C for rotated factor structure on achieved privacy). This suggests that the presented factor structure is valid.

achieved a simple structure (Thurstone, 1947) and has an acceptable amount of high loading items per factor. The latter requirement is met as two factors are composed of four and seven high loading variables (.59 – .85), exceeding the minimum of four high loading items per factor (Guadagnoli & Velicer, 1988). Stevens (2002) proposed that high factor loadings are range between 0.364 and 0.512 in a sample having 100 to 200 cases. Although the remaining two factors are composed of only three items, rather than four, this is acceptable under the circumstance that none of them correlate highly with any other item in the EFA and all of them have high loadings (Hinkin, 1998; see Table C.3 in Appendix C for correlation matrix). The scree plot also supports a four-factor solution considering the convergence of the scree plot, sample size, and Kaiser's criterion of 1 on four factors (Stevens, 2002). The factor pattern loadings are shown in Table 5.

Factor 1 represents acoustical and visual stimulation, factor 2 represents interruptions, factor 3 represents task confidentiality and factor 4 represents conversation confidentiality. Of the six correlation coefficients among the four factors, three were moderately to highly correlated, as can be seen in Table 6. Nevertheless, Varimax rotation was regarded as appropriate as it provided a more balanced distribution of variance explained across the factors than an oblique rotation method. Further, it has been observed that once simple structure is achieved, different rotation and extraction methods yield highly similar results as factor structures are mostly stable across rotations and extraction methods (Clark & Watson, 1995).

Factors 1 and 2 match the expected factors, whereas factors 3 and 4 deviate from the expected factor solution. The anticipated factor confidentiality was separated into task (factor 3) and conversation (factor 4) confidentiality. The anticipated factor "time spent away from others" and its commensurate items were completely excluded during the analysis.

Table 5

Rotated factor loadings on desired privacy (Study 2.A)

	Factor loadings			
Items	Ac. & vis. stimulation	Interruptions	Task confidentiality	Conv. confidentiality
No vis distractions long	**.85**	.19	.19	.11
No vis distractions	**.81**	.14	.17	.13
No noise distractions long	**.80**	.29	.06	.15
Visually calm env	**.76**	.25	.12	.18
No noise distractions	**.74**	.20	.13	.12
Quiet env	**.71**	.35	.03	.10
Min acoust distractions	**.59**	.04	.11	.23
Uninterrupted by queries	.28	**.82**	.12	.10
No asked anything long	.35	**.80**	.12	.12
Less accessible	.08	**.70**	.10	.19
No social engaging	.26	**.67**	.14	.04
Without others seeing	.10	.11	**.98**	.15
Where keep work conf	.14	.13	**.73**	.22
Not looking over shoulder	.19	.15	**.68**	.23
Conf conversations	.12	.23	.38	**.64**
Conv without dist others	.26	.17	.12	**.59**
Non-conf conversations	.24	.03	.34	**.56**

Note. n = 195. Listwise deletion. Extraction: principle axis exploratory factor analysis. Rotation: Varimax.

Table 6

Correlations between desired privacy factors (Study 2.A)

Factors	Ac. & vis. stimulation	Interruptions	Task confidentiality	Conversation confidentiality
Ac. & vis. stimulation	-			
Interruptions	.46	-		
Task confidentiality	.31	.27	-	
Conversation confidentiality	.43	.31	.51	-

Note. n = 195. Listwise deletion.

5.5.2.2 Reliability

Internal consistency reliability (alpha coefficient) was estimated for each of the four dimensions of privacy at work. The coefficient alphas were .93 for stimulation, .88 for task confidentiality, .88 for interruptions, and .74 for conversation confidentiality.

5.5.3 Discussion Study 2.A

The results of Study 2.A give rise to a reasonable factor structure and the first support for adequate psychometric properties of the PAW measure. The final four-factor solution retained the item pool of 17 items. A large proportion of total item variance was explained by the four factors, and all of the factors have an adequate number of high loading items with no evidence of cross-loading. Hence, it is concluded that the four factors retained form four adequate dimensions of the PAW measure. In line with Altman's privacy regulation theory (1975), the dimensions of the PAW represent input and output controls of information. Acoustical and visual stimulation as well as interruptions represent input controls, whereas task and conversation confidentiality represent control of outputs. Correlations are moderate to high between the two input control dimensions (r = .46) as well as between two output control dimensions (r = .51). The reliability of all four dimensions was uniformly high (.74 to .93), and greatly exceeded the minimum desired reliability of .70 (Kline, 1999; Clar & Watson, 1995). Therefore, a second study was justified to provide a confirmatory test of the PAW's psychometric properties and an examination of the measure's construct validity.

5.6 Study 2.B

The goal of Study 2.B was to examine the construct validity of the PAW. The construct validation process should include, according to Borsboom, Mellenbergh, and van Heerden (2004) and other scholars (Ghiselli, Campbell, & Zedeck, 1981; Newton & Shaw, 2013), testing the psychometric properties and the nomological network of the proposed scale. The first will be covered by evaluating the model fit of the four-factor model and comparing it

with the fit of a model with fewer factors. In addition, internal consistency reliability of the four dimensions will be estimated. Testing for the nomological network of the scale involves exploring its convergent-related evidence for construct validity (variables theoretically being related). This will be examined by a set of variables that represent potential differentially associated outcomes of the four privacy at work dimensions. The individual hypotheses are developed below.

5.6.1 Nomological Network: Outcome Relations

Based on Altman's (1975) privacy regulation theory, a poor fit between one's desired and actual levels of privacy is expected to cause stress (e.g. Altman, 1975; Goodrich, 1986). According to job stress models, e.g. the job demands-resources model (e.g. Bakker & Demerouti, 2007), frequent experience of stress at work is expected to be emotionally and mentally damaging, thereby resulting in poor emotional and mental work fatigue (e.g. Frone & Tidwell, 2015). A study by Laurence et al. (2013) found that dissatisfaction with privacy at work was positively related to emotional exhaustion. Although empirical evidence is lacking on the relationship between poor privacy fit and mental fatigue, speculations were made. It was thought that a lack of privacy can interrupt work processes due to uncontrollable input by others, which could result in cognitive fatigue when experienced frequently (e.g. Smith-Jackson & Klein, 2009; Sundstrom, 1986).

Also, several studies have found that prior measures of dissatisfaction with privacy at work were negatively related to workplace satisfaction (Kim & de Dear, 2013; Oldham, 1988; Stokols & Scharf, 1990; cf. Sundstrom, 1986; Veitch et al., 2007). Although most research has focused on the relation of overall dissatisfaction with privacy to personal and work outcomes, exploring the independent relations of the four types of privacy at work to these outcomes would be useful and extend past research. Therefore, the following hypotheses are proposed.

Hypothesis 1: Poor acoustical and visual stimulation fit at work is negatively related to workplace satisfaction, and positively related to stress, and emotional and mental fatigue at work.

Hypothesis 2: Poor interruptions fit at work is negatively related to workplace satisfaction, and positively related to stress, and emotional and mental fatigue at work.

Hypothesis 3: Poor task confidentiality fit at work is negatively related to workplace satisfaction, and positively related to stress, and emotional and mental fatigue at work.

Hypothesis 4: Poor conversation confidentiality fit at work is negatively related to workplace satisfaction, and positively related to stress, and emotional and mental fatigue at work.

5.6.2 Method

5.6.2.1 Study Design

The study population and general procedures for this survey were described in Study 2.A. However, for this study, data was collected seven months after the data collection for study 2.A, when the study population had moved to new work premises. See Study 4 for a description of the environmental change.

5.6.2.2 Sample Size Considerations

As pointed out in the method section of 2.A, the views on the number of participants required to carry out scale validity testing are divergent (Mundfrom, Shaw & Ke, 2005). The previously mentioned minimum participants to item ratio of 3:1 by Cattell (1978) is valid for factor structure validation with confirmatory factor analysis. However, Clark and Watson (1995) propose a sample size of at least 300 participants for factor structure validation and unidimensionality testing. This recommendation is based on existing evidence regarding the stability and replicability of structural analyses (Guadagnoli & Velicer, 1988). Hence, for a

validation of the previously detected factor structure (2.A) and for unidimensionality testing, a sample size of 300 participants is desirable.

Considering the sample size requirements for the nomological analysis, an a priori power calculation with G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) was conducted considering a multiple regression analysis with four predictors (using each dimension or factor as predictor), with power (1-β) set at .95 and α = .05. It was indicated that a sample of n = 129 would be required detect moderate effects (f^2 = 0.15) and a sample of n = 59 would be sufficient to detect large effects (f^2 = 0.35).

5.6.2.3 Participants

A total of 135 respondents participated in the questionnaire, 26 of whom had missing records. Only complete survey responses were included as the use of data imputation methods is not advised for this scale development stage (Çoklu & Kayri, 2011), which resulted in a sample of n = 109. The participants had similar demographic characteristics to the participants of Study 1 and the data set matches the organisation in terms of age (range: 19–66, M = 34.67, SD = 9.56), job grade (all seven grades represented, 10% – 24%), and department size (all departments represented). The gender ratio was more balanced than in the overall population of the organisation: 46% male and 52% female (and 2% missing) in the sample in comparison to 65% male and 35% female in the organisation.

5.6.2.4 Measures

Descriptive statistics for, and correlations among, the study variables are provided in Table 7 (see Table C.4 in Appendix C for a correlation table on the 17 items). As this study was part of a longitudinal research project (Study 4), the survey instrument that contained the 17 items to evaluate the frequency of privacy fit at work as used in Study 2.A was used in

order not to introduce bias due to item reduction. A description of each of the variables can be found in Study 3.

Table 7

Means, standard deviations, and zero-order correlations between study variables and privacy fit dimensions (weighted, Study 2.B)

	Variable	*M*	*SD*	1	2	3	4	5	6	7	8
1	Ac & vis stimulation	-12.36	44.38	-							
2	Interruptions	-5.83	19.86	.60**	-						
3	Conversation conf.	-3.50	16.07	.39**	.50**	-					
4	Task confidentiality	-1.35	21.44	.49**	.47**	.63**	-				
5	Workplace satisfaction	15.17	4.61	.53**	.40**	.45**	.42**	-			
6	Stress	9.78	2.78	-.18**	-.32**	-.15*	-.14*	-.20*	-		
7	Mental fatigue	20.43	5.55	-.18**	-.31**	-.15*	-.18**	-.36**	.51**	-	
8	Emotional fatigue	15.56	7.14	-.27**	-.27**	-.27**	-.24**	-.43**	.51**	.66**	-

Note. $n = 109$. *$p < .05$, **$p < .01$ (2-tailed). Variables as sum composite scores.

5.6.3 Results & Discussion Study 2.B

5.6.3.1 Psychometric Evaluation

Confirmatory factor analysis (CFA) was conducted to validate the factor structure of the PAW that arose from Study 2.A. The CFA was conducted using SPSS AMOS software (Version 25). The maximum likelihood estimator was used as it can correct standard errors and handle potential non-normal data. Four CFA models were tested to compare alternative factor structures – Model 1: a one-factor model; Model 2: a correlated two-factor model (inputs [stimulation and interruptions] and outputs [conversation and task confidentiality]); Model 3: a correlated three-factor model (stimulation, interruptions, and confidentiality [conversation and task confidentiality]; Model 4a: a correlated four-factor model; and Model 4b: a correlated four-factor model with two correlations among error terms. The correlated error terms in Model 4b were suggested modification indices by AMOS. The suggested modifications involved the pairing of two items in the factor stimulation (items 2 and 6) and

the pairing of two items in the factor interruptions (items 8 and 10; see Table C.5 in Appendix C for a table of original items). It is reasonable to expect that items with commensurate meaning may share similar sources of measurement error (Cole, Ciesla, & Steiger, 2007) which justifies the pairing. Finally, to determine whether a specific factor model provided acceptable fit to the data, the following criteria were used: comparative fit index (CFI) and the Tucker-Lewis Index (TLI) ≥ .95, root mean square error of approximation (RMSEA) < .06, and root mean square residual (RMR) < .08 (Hu & Bentler, 1999; Kline, 1999). In the process of achieving model fit, five items were excluded from the models because of their small correlation coefficients (items 1, 3, 7, 9, and 16, see Table C.5 in Appendix C for a table of original items). A model with 12 items was retained (see Table 8 for retained items).

Table 8

Numbered items (Study 2.B)

1	... work with no visual distractions around me
2	... be in a "visually calm" environment with not much happening around me
3	... work with no acoustical distractions around me
4	… be in a quiet environment with not much noise from others around me
5	... work where I do not feel that others can look over my shoulder
6	... work without others seeing what I am working on
7	... work where I can keep what I am working on confidential
8	... have confidential conversations with my co-workers or phone calls without others listening in
9	... have non-confidential conversations with my co-workers without others listening in
10	… be less accessible to my co-workers than I usually am
11	... work uninterrupted by queries from my co-workers
12	... work for a long period of one hour or more at a time without being asked for personal or work-related information

The model fit results are shown in Table 9. As can be seen, a one-factor model (Model 1), $\chi 2$ (52, n = 109) = 300.62, p < .001, does not fit the data as the CFI (.68), TLI (.95), RMSEA (.21), and RMR (.35) do not reach adequate levels. A correlated two-factor model (Model 2) fits substantially better than the one-factor model, $\chi 2$ (51, n = 109) = 184.48, p <

.001, though its overall fit is not acceptable either (CFI = .83, TLI = .76, RMSEA = .17, and RMR = .28). Similarly, a correlated three-factor model (Model 3) fits better than Models 1 and 2, $\chi 2$ (49, n = 109) = 112.12, $p < .001$, but did not achieve acceptable model fit (CFI = .92, TLI = .89, RMSEA = .11, and RMR = .21). Finally, a correlated four-factor model (Model 4a) without correlations among error terms achieves a good overall model fit, $\chi 2$ (48, n = 109) = 87.03, $p < .001$, CFI = .95, TLI = .93, RMSEA = .09, and RMR = .16. The correlated four-factor model (Model 4b) with two correlations among error terms achieves the best overall model fit, $\chi 2$ (46, n = 109) = 63.67, p = .05, CFI = .98, TLI = .97, RMSEA = .06, and RMR = .14. Although the RMR exceeds the recommended threshold of .08 (Hu & Bentler, 1999; Kline, 1999), model fit parameters are to be reviewed in conjunction (Kline, 1999) and all other parameters show good and excellent fit. Of the overall reduction in model fit $\chi 2$ from Model 1 to Model 4b, $\Delta\chi 2$= 236.95, almost all of the reduction (90%) is attributable to the four-factor structure among the items as Study 2.A proposed, with a relatively small additional reduction (10%) attributable to the design-driven correlated errors.

Further supporting the hypothesised factor structure, Table 9 shows the standardised loadings for Model 4a and 4b. Each item had a large and significant (all ps < .001) standardised loading on its respective privacy factor, and introducing the correlated errors in Model 4b had no impact on the factor loadings. Also, the correlations among the privacy factors were unaffected by freeing the correlated error terms and were identical in Models 4a and 4b. As Table 9 shows, all four factors correlate highly with each other (.46 – .66, $p <$ .001). Lastly, the internal consistency reliability estimates were .90 for acoustical and visual stimulation, .85 for interruptions, .76 for task confidentiality, and .78 for conversation confidentiality.

Table 9

Confirmatory factor analysis model fit for PAW (Study 2.B)

Model	x^2	*df*	*p*	CFI	TLI	RMSEA	RMR
Model 1: One factor	300.62	52	< .001	.68	.59	.21 (.18, .23)	.35
Model 2: Two factors	184.48	51	< .001	.83	.76	.17 (.13, .18)	.28
Model 3: Three factors	112.12	49	< .001	.92	.89	.11 (.08, .14)	.21
Model 4a: Four factors no correlated errors	87.03	48	< .001	.95	.93	.09 (.06, .12)	.16
Model 4b: Four factors	63.67	46	.05	.98	.97	.06 (.01, .09)	.14

Note. n = 109. See text regarding correlated measurement errors.

5.6.3.2 Comparison with Previous Measure

A comparison of the four-factor PAW scale with a frequently used two-factor privacy scale by Oldham (1988) showed that PAW explains more variance (79%) than Oldham's scale (59%). Furthermore, Oldham's two-factor scale does not achieve sufficient model fit, x^2 (8, n = 109) = 19.16, p = .01, CFI = .90, TLI = .80, RMSEA = .12, and RMR = .07. In addition, internal consistency reliability estimates for task privacy (α = .62) and communication privacy (α = .67) were below the suggested threshold of .70 (Clark & Watson, 1995; Kline, 1999).

5.6.3.3 Creating Privacy Fit Scores

To prepare the data for the exploration of the relations between the four types of privacy at work and the various outcome variables, privacy fit scores for each type of privacy were calculated. As previously described, the measure asked participants to rate each item by their frequency of desire and by their frequency of achievement or fulfilment when desired (fit). Hence, for each item two scores are given. Both desire and achievement/fulfilment (fit) are rated on a seven-point scale ranging from *1-Never* to *7-All the time*. In order to calculate the relative desire-achievement fit of each privacy item for each participant, the achievement

scores were weighted (multiplied) by their matching desire scores. Before multiplication was performed, the achievement score had to be transformed in order to achieve a meaningful result after the weighting procedure. Therefore, the midpoint of the achievement scale was shifted from 4 (range 1–7) to 0. After this procedure, the transformed achievement scores ranged from -3 to +3. A weighted item ranges from -21 to +21. The maximum negative score, -21, represents the poorest possible weighted fit (Desire: All the time; Achievement: Never) whereas the maximum positive score, +21, represents the best possible weighted fit (Desire: All the time; Achievement: All the time).

Following, two examples are given to exemplify the transformation and weighting procedure. In example A, a participant indicated that in the last four weeks he had desired to work *All the time (7)* with no visual distractions around him. He also gave the answer that he *Never (1)* managed to work without visual distractions. In order to calculate the fit score for the visual distraction item, the achievement score *1 (Never)* was transformed into -3. Afterwards, the transformed achievement score -3 was decreased relative to the frequency of desire; in this example, -3 is multiplied by 7 as the participant wanted to work *All the time* without visual disruptions. The resulting privacy fit score for this item is -21 (7*(-3)) and represents the poorest possible fit (Desire: All the time; Achievement: Never). In example B, a participant indicated that in the last four weeks he had desired to work *All the time (7)* with no visual distractions around him and that he managed to do so *All the time (7).* The achievement score *7 (All the time)* was transformed into +3. Afterwards, the transformed achievement score +3 was increased relative to the frequency of desire; in this example, +3 is multiplied by 7 as the participant wanted to work All the time without visual disruptions. The resulting privacy fit score for this item is +21 (7*(-3)) and represents the best possible fit (Desire: All the time; Achievement: All the time).

5.6.3.4 Nomological Network

For the nomological analysis, mean composite scores for each type of privacy were built by adding the corresponding weighted item scores and dividing them by the number of items. The range of composite privacy fit scores for the four types is from -21 to +21. To provide a more conservative and nuanced exploration of the relations between the four types of privacy at work and the various outcome variables, multiple linear regression analyses are reported (see Table 7 for the correlation matrix and the mean scores of privacy types). For the outcome relations, the four types of work fatigue fit were simultaneously regressed on each of the outcome variables. To explore differences in the strength of the relations between the four types of privacy at work and a given outcome variable, standardised regression coefficients were used because the outcome variables used incommensurate scores (e.g. Willett, Singer, & Martin, 1998).

As shown in Table 10, three of the four types of privacy at work are associated with the outcome variables. Hypothesis 1 was partly supported because acoustical and visual stimulation fit at work was significantly related only to workplace satisfaction ($\beta = .32$, $p < .001$), but not to stress, and emotional and mental fatigue at work. Hypothesis 2 was largely supported as interruptions fit at work was uniquely related to stress ($\beta = -.28$, $p < .001$), and emotional ($\beta = -.15$, $p < .001$) and mental fatigue at work ($\beta = -.29$, $p < .001$), but was not associated with workplace satisfaction. Hypothesis 3 was partly supported as task confidentiality fit was associated with workplace satisfaction ($\beta = .23$, $p < .001$) and with emotional fatigue at work ($\beta = -.05$, $p = .05$), although the latter relationship was borderline significant. Hypothesis 4 was not supported as conversation confidentiality was not associated with the outcome variables. Although significant correlations between conversation confidentiality fit and workplace satisfaction ($r = .42$, $p < .001$), stress ($r = -.14$, $p = .43$), and emotional ($r = -.24$, $p < .001$) and mental fatigue ($r = -.18$, $p < .01$) occurred, all

regression relationships were insignificant. It is possible that effects between conversation confidentiality and the outcome variables are present but too small and that a larger sample size and therewith larger statistical power would yield an effect (see 5.6.2.2 for power calculations).

Table 10

Regression of privacy fit dimensions on outcomes (weighted, Study 2.B)

	Workplace satisfaction		Stress		Mental fatigue		Emotional fatigue	
Independent variables	*b*	*β*	*b*	*β*	*b*	*β*	*b*	*β*
Ac. & vis. stimulation	.14	.32**	-.002	-.04	.001	-.01	-.02	-.14
Interruptions	.10	.14	-.04	-.28**	-.09	-.29**	-.05	-.15*
Conversation conf.	.07	.17	.003	.02	-.02	-.05	.003	.01
Task confidentiality	.19	.23*	.001	.01	.01	.04	*-.05*	*-.13**
R^2	.45**		.08**		.10**		.21**	

Note. *$p < .05$, **$p < .01$ (2-tailed). Numbers in italics are borderline significant.

5.7 General Discussion

The CFA results support the psychometric properties of the PAW. Four factors were identified. Each factor had highly loaded items on its respective factor, thereby discriminating between inputs from acoustical and visual stimulation and interruptions, and outputs from conversations and tasks. Internal consistency reliability for the set of items assessing each type of privacy at work fatigue was uniformly high. The findings also provide convergent evidence for the construct validity of the PAW. Extending past research, the results show a meaningful pattern of relations between specific types of privacy fit and outcome variables.

Firstly, the present study extends prior research on workplace satisfaction and privacy. Workplace satisfaction does not seem to be universally related to all types of privacy, as suggested through the variety of privacy measures that have been used in prior studies (see Chapter 2 for previous measures). In this study, workplace satisfaction was uniquely related to acoustical and visual stimulations and task confidentiality despite numerous empirical

accounts in past research relating workplace satisfaction to privacy (e.g. cf. Sundstrom, 1986). It is plausible that frequent uncontrollable visual and acoustical stimulation is perceptually linked to shortcomings in the design of the workplace and therefore related to reduced workplace satisfaction. For example, if one is sitting directly next to a highly frequented footpath or an area where many co-workers gather and converse then the acoustical and visual overstimulation is an issue relating to the design (rather than being a social/behavioural issue) and therefore might relate to workplace satisfaction. However, relationships to the other privacy types of smaller effect sizes could be likely as the tests were underpowered. Another explanation of this finding could be that previous reports on the relationship between workplace satisfaction and work privacy may be due to methodological flaws in past research (e.g. the use of unspecific constructs, or construct contamination, and weak measures; see also review on prior work privacy measures in Chapter 3). As for the relation between task confidentiality and workplace satisfaction, a similar explanation seems plausible concerning a perceptual link to shortcomings in the design of the workplace. An environment that does not provide adequate spaces to keep work confidential suggests a design flaw and calls for a design solution (e.g. more space between workstations, dividers or bookable rooms).

Secondly, the present study extends past research on privacy at work and outcomes related to psychological health. It was found that infrequent fit with interruptions levels at work, which means that one can frequently work without being interrupted by queries from co-workers, is negatively related to stress, and emotional and mental fatigue. As the hypothesis is two-tailed, it is expected that frequent poor interruptions fit is related to an elevation of stress and the experience of emotional and mental fatigue. As fit with interruptions is related to higher levels of mental than emotional fatigue in this study, it is suggested that frequent uncontrollable interruptions at work particularly deplete mental

resources and therefore lead to mental fatigue. The effect on emotional resources seems to be smaller. As the effect size on experienced stress is of a similar magnitude to that on mental fatigue, it could be assumed that stress experience is related to interruptions of cognitively demandind work and the related mental processes, and potentially their consequences (i.e. delaying work processing). Appraisal theory suggests that events are appraised as particularly negative and result in negative emotions such as feeling stressed if the situation or environmental demand is threatening to something that is at stake (e.g. a work deadline; Folkman & Lazarus, 1985). However, it should be pointed out that the stronger effect of interruptions fit on mental than on emotional fatigue could be sample specific. In line with prior research, Frone and Tidwell (2015) reported that personality traits such as negative emotionality are related to the extent of emotional resource depletion. Hence, the impact of socio-environmental demands on workers and their emotional fatigue levels can be expected to be related to, or moderated by, their personality. The dimension conversation confidentiality was not related to any outcome variable, although it is highly correlated to three of the four outcome variables. It is suggested that the test lacks statistical power due to the small sample size and that the dimension itself lacks statistical power due to its make-up of only two items (attenuation paradox, Clark & Watson, 1995). Lastly, these results suggest that interruptions fit may be more important than fit concerning stimulation, and task and conversation privacy for most of the outcome variables assessed in this study.

5.8 Limitations

The present results should be interpreted within the context of the strengths and limitations of this research. The primary limitation of Study 2 is that it did not use a broad probability sample of office workers in the UK but rather a small sample from one organisation, thereby potentially providing inadequate statistical power for psychometric testing, detecting hypothesised effects and accurate effect sizes (Ioannidis, 2008). Particularly

in study 2.B, the sample size was smaller than recommended for CFA and probably let to underpowered nomological analyses. Further limitations concern the number of items in the dimensions of the measure. An equal number of at least four items per dimension is advised (Harvey, Billings, & Nilan, 1985; Hinkin & Schriesheim, 1989) to obtain adequate internal consistency reliability whereas the dimensions are made up of four, two times three, and two items. Due to having only two items, the dimension conversation confidentiality might lack statistical power in the nomological analysis due to attenuation paradox (Clark & Watson, 1995). Furthermore, the data was used for more than one research purpose: the sample of Study 1 was used for Study 3 to test the privacy appraisal model. Parts of Study 1 and 2 samples were used for the longitudinal Study 4. Although recommended (Kirkman & Chen, 2011), samples were too small to be split for the different studies. The reuse of data for more than one research question/purpose increases the likelihood of detecting an effect.

5.9 Conclusions

For decades, privacy-related issues in work environments have been reported frequently (e.g. Kim & de Dear, 2013). Some scholars consider privacy to be more impactful and concerning in terms of workers' health and work outcomes than commonly investigated environmental factors such as temperature, lighting, or aesthetics (Farrenkopf & Roth, 1980). Although there is no agreed definition of privacy at work, Altman's (1975) privacy regulation theory has been referred to as the most comprehensive (Le Poire et al., 1992) and widely accepted definition of privacy (e.g. Kupritz, 1998; Sundstrom, 1986). It has also been referred to as useful for studying privacy in the organisational context (Kupritz, 1998; Le Poire et al., 1992). Despite the scholarly praise of the privacy regulation theory and the frequently reported privacy-related issues in workplaces, little attention has been given to transferring Altman's conceptualisation to the workplace and to its measurement. Therefore, the central goal of the present study was to psychometrically test a multidimensional measure of privacy

at work that was developed in a previous study (Study 1) and is based on Altman's multidimensional regulation theory in a previous study. The results of the present Studies 2.A and 2.B provide initial support for the psychometric quality and construct validity of the Privacy At Work Inventory (PAW). Two general conclusions can be reached from the present research. First, privacy at work is a multidimensional construct representing workers' controls of different inputs they are exposed to in the work environment and controls of outputs workers give out to others in the work environment. The two input dimensions identified, acoustical and visual stimulation and interruptions, represent indirect inputs and direct inputs from others that require or want to be controlled. The two output dimensions identified, task and conversation confidentiality, reflect outputs that workers might require or want to control considering tasks and conversations at work. Second, to develop a more precise understanding of potential predictors and outcomes of poor privacy fit at work, research should attend to all four types of privacy at work. In contrast to past research, which primarily assessed overall privacy at work, Study 2.B explored nomological relations involving stimulation, interruptions, and task and conversation confidentiality. The results provided a more nuanced understanding of the relations of the four specific types of privacy at work fatigue to a number of outcome variables. Despite interest in privacy at work that dates back several decades, no comprehensive concept and self-report measure had been developed. The present study applied an established framework of general privacy regulation to the work environment in order to develop a valid multidimensional measure of privacy at work. The Privacy At Work Inventory (PAW) can facilitate future research on privacy fit at work as a personal outcome, and as a potential cause of a variety of dysfunctional work-related outcomes.

6 Chapter Six:

Study 3 – Poor Privacy Fit at Work – How it is Associated with Stress, Dissatisfaction, and Fatigue & How Context Factors Can Help

6.1 Abstract

There is limited evidence on the consequences of poor work privacy. This study examines whether frequently experienced poor privacy fit at work results in stress-related consequences at work, specifically in an increase of stress, dissatisfaction, and fatigue. Further, this study aims to shed light on why poor privacy fit might lead to stress-related consequences – an area that is greatly understudied. To do so, this research draws on stress theory and examines whether privacy-related coping appraisal mediates the relationships between privacy fit and the outcome variables. In addition, the study aims to explore preventative measures that impact on poor privacy fit, privacy-related coping appraisal, and its undue consequences. Therefore, the relationships between context variables at work, privacy fit, and coping appraisal are examined respectively. Two survey studies at different time points were conducted in an open-plan office in the UK. Data was consolidated (n = 220) to test the hypotheses using structural equation modelling. The results confirmed that frequent poor privacy fit is associated with an increase in stress, dissatisfaction, and fatigue. Coping appraisal was found to mediate all of these relationships. This suggests that the perception of privacy-related stress largely depends on someone's perceived ability to cope with the privacy-related stressor. Three variables in the work environment were found to influence privacy fit and privacy-related coping appraisal. Firstly, the variety of work settings was related to both variables, whereas behavioural protocols on how office spaces should be used was associated with privacy fit. Location autonomy, which gives workers control over choosing where they work, was found to relate to privacy-related coping appraisal. To the

best of the author's knowledge, this is the first study to investigate privacy with a transactional model of stress.

6.2 Introduction

Despite the interest in work privacy in open-plan offices that dates back several decades, evidence on stress-related consequences of poor work privacy has been limited. Further, an examination of prior research suggests that no comprehensive work had been undertaken to explain why poor work privacy could result in stress-related consequences at work. Furthermore, there is little validated evidence on how different types of context factors at work influence privacy regulation, and therewith could prevent stress-related consequences of poor work privacy. In the attempt to fill to these gaps in the literature, a newly developed model and measure of privacy fit will be tested.

6.2.1 Privacy Fit

The newly developed model of privacy is build on Altman's privacy regulation framework (1975). It follows his "desire-achievement" approach by regarding privacy impairment as a poor fit between desired and achieved privacy. Privacy fit assessment can range anywhere between a good fit (benign-positive) and a poor fit (challenging, threatening, or harmful). Altman's privacy regulation theory (1975) could be regarded as a subordinate theory of person-environment (P-E) fit theory (Edwards et al., 1998), as it corresponds with its principles. P-E fit is defined as the degree to which individual characteristics (i.e. psychological needs) and environmental characteristics (i.e. job demands, cultural values, physical environment, and social environment) match (Edwards, 2008).

6.2.2 Privacy-Related Coping Appraisal

The newly developed model of privacy is characterised by the addition of the variable coping appraisal to Altman's privacy regulation model (1975). This addition should enable

the examination of why poor privacy fit results in stress-related consequences. Coping appraisal is one of two appraisal elements in cognitive appraisal theory (Folkman & Lazarus, 1985). Coping appraisal is the assessment of one's resources in handling demanding situations and whether potential harm can be altered, avoided, or prevented (Park & Folkman, 1997). Appraisal theory suggests that a range of negative emotions at work are fundamentally controlled by appraisal processes, and that cognition is crucial in determining whether environments or relationships at work are experienced as stressful (Lucas, Weidner, & Janisse, 2012). Therefore, this study examines whether privacy-related coping appraisal mediates the relationship between poor privacy fit and outcomes related to stress. It is examined whether a poor privacy fit and low coping appraisal result in stress, and whether high coping appraisal can mitigate the negative emotional response.

6.2.3 Stress-Related Outcomes of Poor Privacy Fit

This study examines whether poor privacy fit is associated with outcomes that relate to stress. Effects are examined on the outcome variables stress, satisfaction, and fatigue. Although these outcome variables are related, their relationship to privacy fit and coping appraisal is examined independently. Each outcome variable and its proposed associations with privacy fit and appraisal are explained below.

6.2.3.1 Job and Workplace Satisfaction

Job satisfaction assesses workers' contentedness with their job and has been defined as "a pleasurable or positive emotional state resulting from the appraisal of one's job or job experiences" (Locke, 1976, p. 1304). Job satisfaction has been operationalised and measured cognitively (evaluatively), affectively (or emotionally), and behaviourally (Hulin & Judge, 2003). Workplace satisfaction assesses workers' contentedness with their physical work environment (Sundstrom, 1986). There is ample empirical evidence associating privacy with job and workplace satisfaction. This finding is consistent across studies using different

operationalisations of privacy that focus on different elements of input and output controls (e.g. acoustical and visual privacy by Kim & de Dear, 2013; speech privacy and task privacy by Oldham, 1988; or general privacy by Sundstrom, 1986). However, as explained before, previous operationalisations of privacy have significant limitations. The present research builds on Altman's conceptualisation of privacy (1975), which is related to P-E fit. Occupational P-E fit research shows that an often-observed result of a mismatch between the characteristics of the work environment and workers' desires is associated dissatisfaction and related negative emotions (cf. Furnham & Schaeffer, 1984; Ostroff & Judge, 2007). Further, the present research takes a cognitive appraisal approach. A potential rationale for the link between appraisal and satisfaction is based on the affective nature of job satisfaction. Environmental appraisals are the basis for emotional responses (Folkman & Lazarus, 1985). It is argued that coping appraisal becomes salient if there is a poor fit between a person's desire for privacy and the actual socio-environmental conditions. If privacy-related coping is additionally appraised as negative, a negative emotional satisfaction response is likely.

As previous studies have not operationalised privacy sufficiently, the present research aims to validate the findings on workplace and job satisfaction with multidimensional operationalisation (measure) of privacy. Further, the present research extends previous research by investigating whether privacy-related coping appraisal mediates the relationship between poor privacy fit and satisfaction.

6.2.3.2 Stress

Conventional models of stress in psychology have defined stress in different terms. Either stress or stressors are understood as pressure in the (work) environment (Dewe & Guest, 1990), for example "demands of a taxing job" (p. 136), or stress is seen as "needs inside the individual which are blocked" (p. 136). There are also theories that relate specifically to environmental stress, such as the load theory (Cohen, 1978) and the arousal

hypothesis (cf. Evans, 1979). These models understand stress as an element in a unidirectional environment-person relationship, whereas cognitive theorists (i.e. cognitive appraisal theory by Folkman and Lazarus, 1985) have argued that the process is more complex (Dewe & Guest, 1990). In cognitive theories, such as appraisal theory (Folkman & Lazarus, 1985), stress is a transactional relationship "between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and as endangering his or her well-being" (Folkman, 1984, p. 840). The present research employs a transactional perspective to privacy and privacy-related stress as individuals show diverse responses to an identical environmental stimulus or environmental demand (Caplan et al., 1975). Hence, it is argued that for determining stress reactions an individual's appraisal of the environmental stressor (such as poor privacy fit) is more impactful than the actual state of the environment (Caplan et al., 1975; O'Neill & Carayon, 1993).

It has been suggested that stress is the result of unmet privacy needs (e.g. Altman, 1975; Johnson, 1974) but there is little empirical evidence of this. The little evidence available (Goodrich, 1986; O'Neill & Carayon, 1993) is either concerned with single elements of privacy (either the impact of unsuccessful input or output controls) rather than assessing the impact of the full multidimensional nature of privacy, or varies in its' approach to stress (clearly defined or loose, transactional or deterministic). There is ample evidence in occupational P-E fit research and occupational appraisal research linking poor P-E fit (cf. Edwards & Cooper, 1990) and negative appraisal of person-environment encounters to stress reactions (e.g. Dewe, 1991, 2003). As the multidimensionality of privacy has so far been linked to stress only in theoretical works, and as the previous research has not specifically observed a link between privacy and stress appraisal, the present research aims to examine the transactional relationship between multidimensional privacy fit, privacy-related coping appraisal, and stress.

6.2.3.3 Emotional Fatigue

Emotional work fatigue is one of three dimensions of Frone and Tidwell's (2015) burnout framework, which aims to offer a more coherent and differentiated approach to the concept of burnout. According to this new framework, work fatigue, or burnout, occurs in respect of the expenditure of three "types of energetic resources" (p. 2), one of which is an emotional energy resource, "involving expression and regulation of emotions" (p. 2). Consequently, a huge expenditure of emotional resources results in emotional work fatigue. This interplay between demands, resources, and fatigue that Frone and Tidwell's (2015) work is built on is well researched and documented in occupational stress theory, such as the job demands-resources theory (e.g. Bakker & Demerouti, 2007) and the occupational person-environment fit theory (Edwards & Cooper, 1990).

Previous empirical results on the relationship between poor privacy fit and emotional fatigue are scarce and have limitations. The results of the study by Laurence et al. (2013) suggest a relationship between task and communication privacy (scale by Oldham, 1988) and emotional fatigue (using a subscale of the Maslach Burnout Inventory). While this study operationalised emotional fatigue well, the operationalisation of privacy was weak.

P-E fit research gives sufficient empirical support for poor P-E fit being associated with emotional fatigue (Edwards & Harrison, 1993; Jamal & Baba, 2000; Vandenberg et al., 2002). Similarly, appraisal research has elicited empirical results on frequent experience of stress and work fatigue (Folkman et al., 1986). By employing a multidimensional operationalisation of privacy and using a transactional stress approach, the present research examines whether a frequently poor privacy fit is associated with increased emotional fatigue. Further, it will be investigated whether coping appraisal mediates the relationship between poor privacy fit and fatigue.

6.2.3.4 Mental Fatigue

Mental work fatigue is the second of the three dimensions of Frone and Tidwell's (2015) burnout framework. Mental work fatigue occurs in respect of the frequent expenditure of mental energy resources, which involves cognitive processing. Consequently, a huge expenditure of mental resources results in mental work fatigue. It is assumed that mental resource expenditure occurs when dealing with poor privacy fit during task completion because cognitive processes involved in task completion are hindered, for example, by acoustical and visual distractions and interruptions (inputs), or by trying to keep conversations or work confidential (outputs).

In theoretical works, frequent input such as distractions that are characterised as uncontrollable and take away attention have been linked to cognitive depletion in office workers (cf. Cohen, 1978; cf. Sundstrom & Sundstrom, 1986). Supporting empirical evidence is reduced to the effects of frequent noise distractions on mental fatigue (Cohen & Spacapan, 1978). Laurence et al. (2013) suggest an effect of output controls, such as keeping work and conversations confidential, on mental fatigue. They postulate that controlling outputs while pursuing work assignments requires workers "to divide their mental attention" (p. 145). A dividing of attention requires additional expenditures of mental resources and can lead to cognitive fatigue when experienced frequently (e.g. Leroy, 2009). Further, expenditure of cognitive resources because of the process of stress appraisal itself has been suggested (cf. Kahneman, 1973; Lazarus, 1966; Scott et al., 2015). Consequently, it has been proposed that mental fatigue is a likely result if environmental demands are frequently experienced as stressful (Cohen & Spacapan, 1978).

The present research will investigate whether privacy-related coping appraisal explains some of the effect of frequent poor privacy fit on mental fatigue. Further, the present research

aims to extend the current evidence base by assessing whether a multidimensional operationalisation of poor privacy fit (inputs and outputs) is associated with mental fatigue.

6.2.3.5 Control Variable: Job Demand

Job demand is an established contributor to stress, fatigue, and satisfaction at work (cf. Frone & Tidwell, 2015). Therefore, any examination of poor privacy fit on these outcome variables should control for the effect of job demand.

In summary, the following hypotheses are proposed:

Hypothesis 1: Frequent privacy fit is positively related to job and workplace satisfaction, and negatively related to stress, and emotional and mental work fatigue, when controlled for job demand.

Hypothesis 2: The relationships between privacy fit and satisfaction, stress, and fatigue are mediated by coping appraisal, when controlled for job demand.

6.2.4 Contextual Factors

Three workplace factors that have been proposed as being conducive to privacy regulation in open-plan office environments but lack research evidence are explored for their impact on privacy fit and privacy-related coping appraisal.

6.2.4.1 Environmental Contextual Factor: Variety of Work Settings

Variety of work settings refers to a multitude of work settings that differ in their designs to support the various tasks an office worker might face throughout the day. Oseland (2009) suggested that these types of settings are helpful in regulating interpersonal contact in open-plan offices. According to behaviour settings theory, places that are distinctively different and are linked to certain behaviours provide coherence in social settings (cf. Barker, 1968). Therefore, offices that offer a variety of settings to support distinctively different tasks (and types of privacy) could provide an optimal environment for privacy regulation. For

example, when working by oneself, quietly, in a “library zone” in the office, it would be unacceptable if someone talked loudly or if a colleague was to approach someone in the library space if it was not for a good reason. However, there is relatively little evidence to support this claim. Most of the evidence that does exist is non-peer-reviewed industry research (e.g. Flynn, 2014) with little information on study design and methods. This study aims to test the relationship between the frequency of privacy fit and the variety of work settings. Further, this study aims to test whether the variety of work settings is linked to increased privacy-related coping appraisal. This aim finds support in stress appraisal research, which identified environment characteristics as an influential factor in the appraisal process; environment characteristics have been found before to be perceived as a coping resource (Lazarus & Cohen, 1977).

6.2.4.2 Social Contextual Factor: Protocols

Protocols refer to an office etiquette on how to use different types of office spaces correctly to prevent misunderstandings and conflict (Oseland, 2009). For example, a guideline could be not to have calls on speakerphone in the open-plan office. In line with behaviour settings theory (cf. Barker, 1968), protocols should increase the coherence of different settings as they fortify/underpin the rules of using them, which can be conducive to increasing privacy fit. There is some evidence on the importance of unspoken rules that cue acceptable behaviour at work related to privacy (e.g. Justa & Golan, 1977; Steele, 1986) and on the usefulness of protocols in decreasing disturbances by colleagues (e.g. Bellingar et al., 2006; Brennan et al., 2002; Hedge, 1982; Kupritz & Haworth, 2005). This study aims to validate previous results and test whether there is a relationship between others adhering to protocols and privacy fit. Further, this study aims to test whether adherence to protocols increases privacy-related coping appraisal.

It is proposed that a clear set of rules and the belief that these rules are acted upon could increase the perception of having the resources to cope with poor privacy fit. This could be explained by an increased sense of predictability towards stressors. Predictability is an established stress characteristic and can facilitate adaptation in terms of both avoiding future difficulties (i.e. seeking the correct settings for one's needs) and dealing with present ones (Baum et al., 1981; Lazarus & Launier, 1978). A number of studies have demonstrated the value of such information as it applies to the regulation of emotion or to the regulation of the environment (e.g. Johnson & Levanthal, 1974; Langer & Saegert, 1977). It is suggested that information gained through protocols increases one's sense of control and one's confidence in coping (e.g. Janis, 1968 in Baum et al., 1981).

6.2.4.3 Social Contextual Factor: Location Autonomy

Location autonomy refers to employees' ability to choose their preferred work location in the office rather than just sitting in sight of their manager. There is no established term to describe this variable. Flynn (2014) suggests that location autonomy provides the freedom to regulate interpersonal access. However, the evidence base on the usefulness of location autonomy is scarce. There is some evidence but it is limited to ABW environments (e.g. Robertson et al., 2008) oppose to traditional open-plan offices. This study aims to test whether location autonomy in a standard open-plan office is associated with an increase in privacy fit. Further, this study will test whether location autonomy is related to privacy-related coping appraisal. Conceptually, location autonomy is related to job autonomy (Medik & Stettina, 2014; Szilagyi & Holland, 1980), which provides the freedom to decide how one's job is structured and conducted (Leach et al., 2003). Appraisal research shows that job autonomy predicts job-stress appraisal (e.g. Prem et al., 2016). In this line of thinking, it is postulated that location autonomy is another type of resource for handling privacy-related demands, and therefore increases the associated appraisal of coping resources.

In summary, the following hypotheses are proposed:

Hypothesis 3: Frequent privacy fit is associated with (a) the variety of work settings, (b) protocols, and (c) location autonomy.

Hypothesis 4: Coping appraisal is associated with (a) the variety of work settings, (b) protocols, and (c) location autonomy.

6.3 Study Aims

The aim of Study 3 is threefold. Firstly, the aim is to explore how privacy fit influences a range of stress-related outcomes. Secondly, the aim is to explore the role of privacy-related coping appraisal in the relationship between privacy fit and the outcome variables. Thirdly, the aim is to examine the influence of social and physical environmental context variables on privacy fit and coping appraisals. See Figure 2 for the hypothesised relationships.

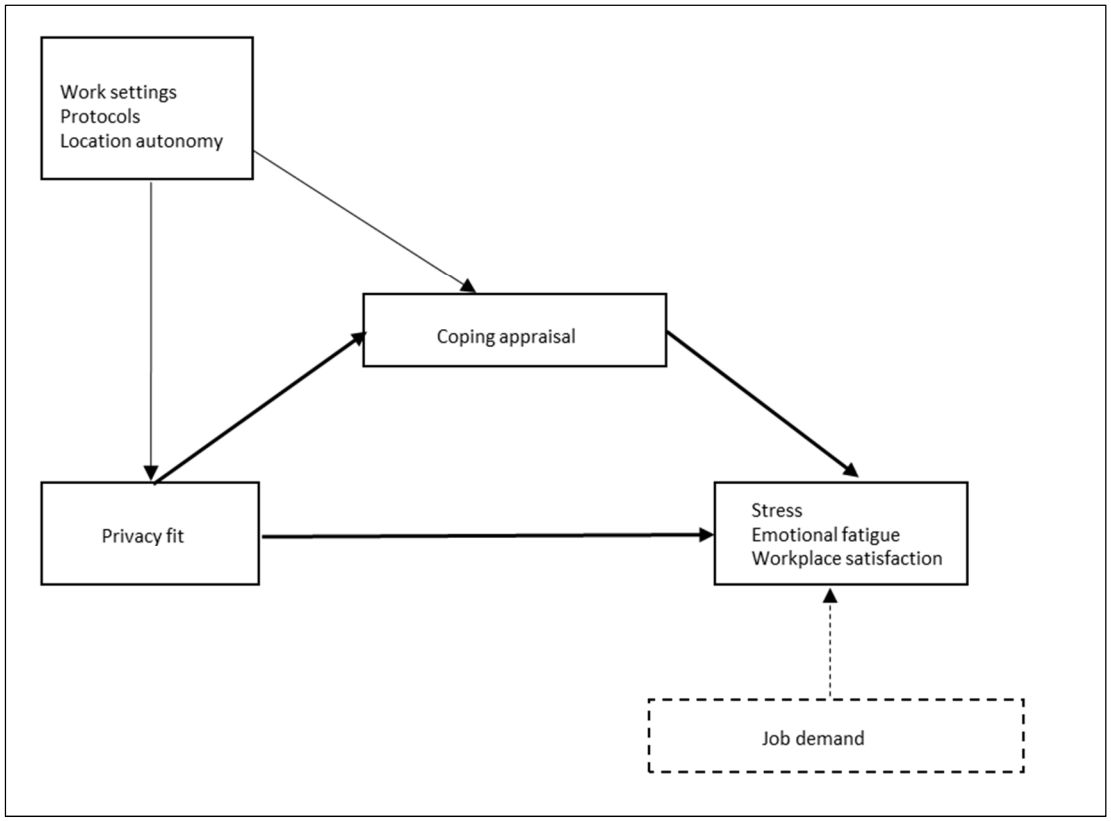


Figure 2. Hypothesised model.

6.4 Method

6.4.1 Study Design

For this study, longitudinal data, which assessed the same group of office workers at two time points, were partially consolidated. As the two data sets used in this study were also used in Study 2 (scale testing) and Study 4 (longitudinal study), procedures for conducting the online surveys were described there. In terms of ethical considerations, based on the completed "Self-Assessment Form: Ethics", a submission of a full application to the University Ethics Committee was not required.

6.4.2 Sample Size Considerations

Path analysis requires a critical mass of data in order to achieve the required statistical power. There is no consensus on optimal sample size due to the many different model parameters possible. Some scholars argue that a simple SEM model could be tested with less than 100 cases (Hoyle, 1999; Marsh & Hau, 1999). However, numerous scholars suggest a minimum of 200 cases (e.g. Boomsma & Hoogland, 2001; Hoogland & Boomsma 1998; Kline, 2005), particularly for covariance-based SEM (Nasser & Wisenbaker, 2003), regardless of other data characteristics, to obtain acceptable fit and avoid improper solutions, such as negative variance estimates (Heywood cases) or correlations greater than one (Dillon, Kumar, & Mulani, 1987). Therefore, a sample size of at least $n = 200$ is desirable for Study 3.

6.4.3 Data Consolidation

In order to reach the minimum suggested sample size of 200 cases to test the suggested privacy appraisal model, two samples of a longitudinal study (Study 4) were consolidated ($n = 282$). The sample consisted of all responses from the longitudinal Time 1 questionnaire ($n = 238$) and of those responses from the longitudinal Time 2 questionnaire that were given by participants who had not taken part in Time 1 ($n = 44$). Therefore, the reduced Time 2 data set can be categorised as an additional sample and does not include duplicated responses. A

dummy variable was included to control for possible bias due to the difference in data collection time and environmental context. Furthermore, a separate regression analysis on the complete Time 2 data set replicated the relationships within the model, which encouraged the decision of data consolidation.

6.4.4 Participants

The consolidated sample consisted of 282 (out of 479) valid questionnaire responses. It had similar characteristics to the overall study population in terms of age (M = 36.2, SD = 10.8, range 19–72), gender ratio (60% male, 39% female, and 1% missing; gender ratio of organisation: 65% male, 36% female; HR data, 2016), and job grade (all grades represented, 9% – 18%). A comparison of the sample characteristics of the original parts of the consolidated data set showed no significant difference in age (M_1 = 36.6, M_2 = 33.9, SD_1 = 11.4, SD_2 = 8.7, $t(280) = 1.49$, $p = .14$) or gender (x^2 (1) = 6.33, $p > .05$).

6.4.5 Handling Missing Data

For the subsequent analysis, path modelling in AMOS, a data set without missing data is required. Missing values were found in 104 out of 282 cases. Responses were considered if missing responses amounted to less than 5% relative to responses for each variable and the number of items in the questionnaire (Lowry & Gaskin, 2014). This resulted in a data set of 220 cases. The Little's test supports the assumption that records are missing completely at random and not systematically, $\chi 2$ (442, n = 220) = 449.37, $p = .39$. The remaining missing cases were replaced by using mean imputation as it is a reasonable data imputation procedure for variables that are normally distributed (Kang, 2013), which they were. Artificially reduced variance and standard errors were identified as the main concern for single imputation methods such as mean substitution (e.g. Malhotra, 1987). However, mean imputation did not significantly bias the variables' distribution and variability. A comparison of standard errors and standard deviations between original and replaced variables indicated

marginal differences: the average SE difference between original and replaced variables was 0.02 (range 0.00–0.09), and the average SD difference was 0.17 (range 0.00–0.82).

6.4.6 Measures

Descriptive statistics for, and correlations among, the variables are provided in Table 11. Measures of each variable are described below. To increase accuracy in the assessment for this study, all items were adjusted to refer to participants' workplace experience over a period of the previous four weeks.

Table 11

Means, standard deviations, and zero-order correlations between study variables (Study 3)

Variable		*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11
1.	Privacy fit	-35.30	74.98	-										
2.	Coping appraisal	14.79	4.06	-.48**	-									
3.	Stress	9.59	2.77	-.24**	.28**	-								
4.	Emotional fatigue	15.54	6.58	-.29**	.27**	.50**	-							
5.	Mental fatigue	20.38	5.62	-.21**	.15*	.47**	.64**	-						
6.	Workplace satisfaction	13.42	4.62	.50**	-.42**	-.28**	-.36**	-.25**	-					
7.	Job satisfaction	12.79	13.37	.10	-.03	-.07	-.13	-.08	.05	-				
8.	Job demand	21.31	4.49	-.20**	.19**	.61**	.38**	.31**	-.29**	.09	-			
9.	Protocols	4.25	1.68	.25**	-.21**	-.13	-.23**	-.09	.33**	-.05	-.27**			
10.	Autonomy	7.19	3.21	.13	-.25**	.01	-.05	.01	.22**	.06	.02	.03	-	
11.	Settings	3.63	1.57	.33**	-.30**	-.15*	-.25**	-.13	.55**	.03	-.21**	.19**	.28**	-

Note. Pairwise deletion, $n = 220$ *$p < .05$, **$p < .01$ (2-tailed).

6.4.6.1 Frequency of Privacy Fit

The 12-item Privacy At Work Inventory (PAW) was used to assess the frequency of privacy fit at work during the previous four weeks (see Chapters 6 and 7 for scale development and testing). The measure assesses the frequency of participants' desire and achievement of each privacy item over the last four weeks when working in the office. In the survey, the 12 items were presented in one table with two columns: first, participants rated the frequency of how often they wanted to work in each of the 12 privacy conditions

described by the items; subsequently, they rated the frequency of how often they were able to work in each of the 12 privacy conditions (when they wanted to). The measure has four subscales: 1). Acoustical and visual stimulation (four items, example item *work with no acoustical distractions around me*); 2). Task confidentiality (three items, example item *work where I can keep what I am working on confidential*); 3) Conversation confidentiality (two items, example item *have confidential conversations or phone calls with my co-workers without others listening in*); 4. Interruptions (three items, example item *be less accessible to my co-workers than I usually am*). The scale ranged from (1) *Never* to (7) *All the time*.

A new variable named "privacy fit" was created by recoding and weighting the "privacy achievement scores" by the "privacy desired scores". Therewith, the "fit" of each item on the privacy scale was reduced or increased relative to how often it was desired (see Study 2 for full procedure and rationale). As a final step, a composite score for privacy fit was built by summing the 12 weighted item scores (range = -252–252; M = -35.30, SD = 74.98, α = 76 - 90). Negative scores reflect a frequently low privacy fit, scores close to 0 suggest a neutral fit, whereas positive scores suggest a frequently high privacy fit.

6.4.6.2 Coping Appraisal

For this study, four items of Dewe's (1991) six-item coping appraisal scale were used. Coping appraisal was assessed with items that describe the appraisal of coping options (*could change or do something about; must be accepted or just got used to; hold oneself back; if dealt with in the way wanted it would have made things difficult*). Two items of Dewe's scale were not included as they were not relevant for the study (*the organizational bureaucracy made it difficult to deal with; needed to know more before could act*). As the majority of the four items reflected "uncontrollable situations" (Peacock & Wong, 1990, p. 232) and only one item reflected "controllability by oneself" (p. 232), another item was added reflecting the latter theme which is important to the coping appraisal construct (*could think of lots of ways*

to do so). An example of the five-item scale is *In the last 4 weeks, when I was in situations in which I wanted less contact with my co-workers in the base office building, I had to accept that I couldn't achieve it and get used to the situation*. In line with the original measurement, a five-point rating scale ranging from (1) *Strongly disagree* to (5) *Strongly agree* was used. Internal consistency reliability was good (α = .83). A composite score was created by computing the sum score of the five items (range: 5–25, *M* =14.79, *SD* = 4.06). A low score reflects high coping appraisal and the perception of being able to do something about the situation.

6.4.6.3 Work stress

Stress at work was assessed with a shortened three-item subjective stress at work scale (Motowidlo, Packard, & Manning, 1986). This scale was preferred over assessing the range of negative affect (e.g. PANAS), as done in traditional cognitive appraisal research (Folkman & Lazarus, 1985), to prevent respondents becoming fatigued. An example item is *In the last 4 weeks, very stressful things happened to me at work*. Responses were made on a five-point rating scale ranging from (1) *Strongly disagree* to (5) *Strongly agree*. The internal consistency reliability of the measure was high (α = .85). A new variable was created by building sum composite scores (range: 3–15, *M* = 9.59, *SD* = 2.77). High scores reflect high levels of stress.

6.4.6.4 Emotional and Mental Fatigue

Emotional and mental work fatigue, two independent variables, were assessed using Frone and Tidwell's (2015) Three-Dimensional Work Fatigue Inventory. This is a multidimensional inventory, originally taking into account three different resource-specific types of fatigue at work (emotional, mental, and physical). The dimensions assessing

emotional and mental fatigue were used for this study.[12] Each dimension is assessed with six items and the frequency of fatigue occurrence was rated on a five-point rating scale ranging from (1) *Never* to (5) *Every day*. An example item for the mental fatigue assessment is *During the past 4 weeks, how often did you feel mentally exhausted at the end of the workday?* An example item for the emotional fatigue assessment is *During the past 4 weeks, how often did you feel emotionally exhausted at the end of the workday?* The study found similarly high internal consistency reliability scores to Frone and Tidwell (2015): α = .97 for emotional fatigue and α = .96 for mental fatigue. Two new variables were created by building sum composite scores for emotional work fatigue (range: 6–30, *M* = 15.54, *SD* = 6.58) and mental work fatigue (range: 6–30, *M* = 20.38, *SD* = 5.62). A high score reflects frequent fatigue.

6.4.6.5 Workplace and Job Satisfaction

Workplace satisfaction was assessed using a three-item measure by Oldham (1988) with two affect-related items and one cognition-related item. The wording was amended to suit the study. An example item is *In the last 4 weeks, the workplace environment in my base office building supported me well in the daily tasks I had to perform*. Participants rated their agreement with the statements on a seven-point rating scale from (1) *Strongly disagree* to (7) *Strongly agree*.

Job satisfaction was assessed using a three-item scale by Lee and Brand (2005) with two affect-related items and one cognition-related item. The wording was amended to suit the study. Participants rated their agreement with the statements on a five-point rating scale from (1) *Strongly disagree* to (5) *Strongly agree*. An example item is *In the last 4 weeks, I have been satisfied with my job*. Both scales had excellent internal consistency reliability scores: α

[12] The survey included the complete Three-Dimensional Work Fatigue Inventory by Frone and Tidwell (2015). However, only the emotional and mental fatigue dimensions were used for analysis to increase the focus of the present research.

= .94 and α = .85. Two new variables were created by building sum composite scores for workplace satisfaction (range: 3–21, *M* = 13.42, *SD* = 4.62) and job satisfaction (range: 3–15, *M* = 12.79, *SD* = 13.37). High scores reflect high levels of satisfaction.

6.4.6.6 Control Variable:[13] Job Demand

Job demand was assessed using a measure by Elovainio et al. (2015). This four-item scale was used due to its similarity to the job demand dimension of Karasek's original Job Contents Questionnaire (1979). Originally, the aim was to employ the original Karasek measure but project funds were not available to afford its purchase. For closer representation of Karasek's measure, two items (intensive work and conflicting demands), derived from the UK Health and Safety Executive's Management Standards (Edwards, Webster, Van Laar, & Easton, 2008), were added. The wording was amended to suit the study. An example item is *In the last 4 weeks, I had to work very fast*. All items were rated on a five-point scale ranging from (1) *Strongly disagree* to (5) *Strongly agree*. The internal consistency reliability score of the six-item scale was excellent (α = .90). A new variable was created by building sum composite scores for job demand (range: 4–20, *M* = 21.31, *SD* = 4.49). High scores reflect high levels of job demand.

6.4.6.7 Variety of Settings[14]

The variable variety of settings was assessed with a one-item measure. It was taken from the "Leesman survey", which is an industry service survey for assessing office adequacy (Leesman, 2017). Participants rated whether the design of their office encouraged them to use different settings that best support their work tasks. Participants rated their agreement with this statement on a seven-point scale from (1) *Strongly disagree* to (7)

[13] Originally, the study included more control variables (duration of employment, characteristics of daily work, amount of people in the office, number of people visible from desk, desk sharing, office move-related affect). For clarity, these controls were excluded from the text as preliminary analysis showed no impact.
[14] Originally, the study included the variable "number of settings". As the variable variety of settings had more predictive power and the variable "number of settings" became insignificant in the overall model, it was excluded from the text for clarity.

Strongly agree. Although this measure assesses participants' perception of an environmental feature rather than being an objective environmental assessment, previous research has shown that self-reported scales about objective characteristics can have merit. For example, one-item self-reported health scales are regarded as the gold standard in assessing physiological ill health in health psychology (Phillips, Der, & Carroll, 2010). Nonetheless, it should be noted that this is a subjective assessment and that an increased use is likely to explain an increased awareness. Low scores reflected little variety (range: 1–7; $M = 3.63$, $SD = 1.57$).

6.4.6.8 Protocols

Protocols were assessed by a one-item measure developed for this study. Following a definition of the concept by Oseland (2009), participants rated their agreement on whether people in the office adhered to the protocols about the use of space on a seven-point scale from (1) *Strongly disagree* to (7) *Strongly agree*. Low scores reflected little adherence of others to the protocols (range: 1–7; $M = 4.25$, $SD = 1.68$).

6.4.6.9 Location Autonomy

Location autonomy was assessed with three items developed specifically for this study, as no measurement of the concept was available. An example item is *In the last 4 weeks, even if I could have worked somewhere else, I felt I should work at my desk*. All items used a seven-point response scale ranging from (1) *Strongly disagree* to (7) *Strongly agree*. Informed by internal consistency reliability analysis, one item was excluded. The final Cronbach's alpha of the two-item scale was $\alpha = .70$ and therefore it reached the minimum desired reliability (Nunnally & Berstein, 1994). A new variable was created by building sum composite scores for location autonomy (range: 2–14, $M = 7.19$, $SD = 3.21$). High scores reflect high levels of location autonomy.

6.5 Results

6.5.1 Model Adjustments

Path modelling was performed in AMOS and the maximum likelihood estimates method was chosen over other estimation methods (weighted least squares, unweighted least squares, asymptotically distribution-free) because the data was distributed normally (Kline, 2005). The final version of the model excludes the following three variables due to their insignificance in the path model: the outcome variables mental fatigue and job satisfaction, as well as the control T1-T2 dummy variable. Mental fatigue was not associated with privacy fit (β = -.13, p = .09), nor by coping appraisal (β = .06, p = .41). Job satisfaction was associated with privacy fit (β = .16, p = .04) but the effect was unstable across the two data sets as an additional analysis revealed.[15] Therefore, both variables were excluded from the final model.

The T1-T2 dummy variable had no effect on the independent variables privacy fit (β = -.04, p = .52), coping appraisal (β = .09, p = .21), protocols (β = -.01, p = .47), and location autonomy (β = -.002, p = .68), or on the dependent variables workplace satisfaction (β = -.05, p = .46), work stress (β = .01, p = .83), and emotional fatigue (β = .06, p = .29). An effect was only found on the variety of settings variable (β = .14, p = .01). As the aim was to reduce the complexity and degrees of freedom in the model, the dummy variable was excluded from the final model. This step was justified by there being no systematic difference in eight of the nine variables in the model. In addition, regression analyses on the Time 1 data set validated the SEM results. Hence, a systematic bias due to the merger of the two data sets is unlikely.

Covariances were drawn between the error terms of endogenous (dependent) variables and exogenous (independent) variables due to expected correlations that are not part of the

[15] Separate regression analyses on the complete data of Time 1 (n = 238) and Time 2 (n = 135) showed that job satisfaction was only associated with privacy fit and coping appraisal in the Time 1 data set. An independent t-test revealed that job satisfaction ratings are significantly different in the Time 1 (M = 13.22, SD = 3.52) from the Time 2 (M = 9.90, SD = 1.87) data set (t(259) = 7.64, p < .001).

theoretical model under investigation. These covariate relationships with their correlation estimates are displayed in Table E.1, as are variances of exogenous variables in Table E.2, both in Appendix E.

6.5.2 Model Fit

The final model supports most of the hypotheses and shows excellent model fit. All significant relationships are diagrammatically presented in Figure 3. Hypothesis 1 is mostly supported as participants were more satisfied with their workplace (B = .02, SE = .004, β = .24, p < .001), less stressed (B = -.02, SE = .006, β = -.17, p = .01), and less emotionally fatigued (B = -.02, SE = .006, β = -.17, p = .01) when they had frequent privacy fit. Privacy fit was not related to mental fatigue or job satisfaction as hypothesis 1 suggested (see values above). Hypothesis 2 was mostly supported as the relationships between privacy fit and workplace satisfaction, stress, and emotional fatigue were mediated by coping appraisal. As privacy was not related to job satisfaction and mental fatigue, no mediation was found for these relationships. In support of hypothesis 2, there are two types of results. Firstly, there is a triangular relationship between privacy fit, coping appraisal, and the outcome variables. Privacy fit was significantly associated with coping appraisal (B = -.02, SE = .003, β = -.41, p < .001), which in turn was associated with workplace satisfaction (B = -.15, SE = .07, β = -.13, p = .02), stress (B = .10, SE = .04, β = .15, p = .01), and emotional fatigue (B = .20, SE = .11, β = .12, p = .05). Secondly, by using Hayes's (2013) PROCESS tool, the mediation effects of coping appraisal on the relationships between privacy and workplace satisfaction (*ab_cs* = .10, BCa Cl [.04, .17]), stress (*ab_cs* = -.07, BCa Cl [-.13, -.01]), and emotional fatigue (*ab_cs* = -.08, BCa Cl [-.16, -.01]) were supported. To ease the interpretation of effect sizes, coefficients are presented in standardised format as all variables in the model have different units (Kelley & Preacher, 2011). The nature of the three mediating relationships varied: coping appraisal partially explained the effect privacy fit had on workplace

satisfaction (the c' path of privacy on satisfaction was significant), whereas the effects of privacy on stress and emotional fatigue were fully explained by coping appraisal (the c' path of privacy on stress and fatigue was insignificant). Hypothesis 3 was partially supported as the frequency of privacy fit was associated with variety of settings (B = 13.97, SE = 3.04, β = .29, $p < .001$), and protocols (B = 8.80, SE = 2.84, β = .20, p = .002). Location autonomy had no effect (B = 1.82, SE = 1.57, β = .08, p = .25) on privacy. Hypothesis 4 was also partially supported as coping appraisal was associated with variety of settings (B = -.300, SE = .16, β = -.12, p = .05), and location autonomy (B = -.220, SE = .08, β = -.17, p = .005). Protocols had no effect (B = -.21, SE = .14, β = -.09, p = .15) on coping appraisal.

Model fit indices suggest a good model fit. The absolute fit indices chi-square (χ^2 (9) = 15.18, $p = .09 > .05$) and RMSEA (.05 < .06; 90% CI .00, .10) suggest good overall fit (Barrett, 2007; Hu & Bentler, 1999; Steiger, 2007). However, the RMSEA confidence interval upper limit should ideally be less than .08 for a well-fitting model whereas the present upper limit is .10 and therewith includes a 10% possibility of incorrectly rejecting the null hypothesis (Hooper, Coughlan, Mullen, 2008; McQuitty, 2004). Both indices were chosen because chi-square is a traditional measure for evaluating overall model fit (Hooper et al., 2008) and RMSEA has been coined as "one of the most informative fit indices" (Diamantopoulos & Siguaw, 2000, p. 85 in Hooper et al., 2008, p. 54). NFI (.97) and CFI (.99) suggest excellent incremental or relative model fit as both values are above the newly adjusted cut-off: ≥ 0.95 (Hu & Bentler, 1999). Both indices were chosen as NFI performs well on samples over 200 (Bentler, 1990; Hooper et al., 2008; Mulaik et al., 1989) and CFI takes sample size into consideration (Tabachnick & Fidell, 2007). The model's parsimony fit value PNFI (.30), which compensates for the complexity of the model, suggests a medium fit. PNFI values within the .50 region were suggested to represent good fit (Mulaik et al., 1989). Nonetheless, an improper model (Heywood) solution does not seem likely as unique

variances are not close to zero and standard errors are not large (McDonald & Ho, 2002). See Appendix E for a full explanation of the fit indices.

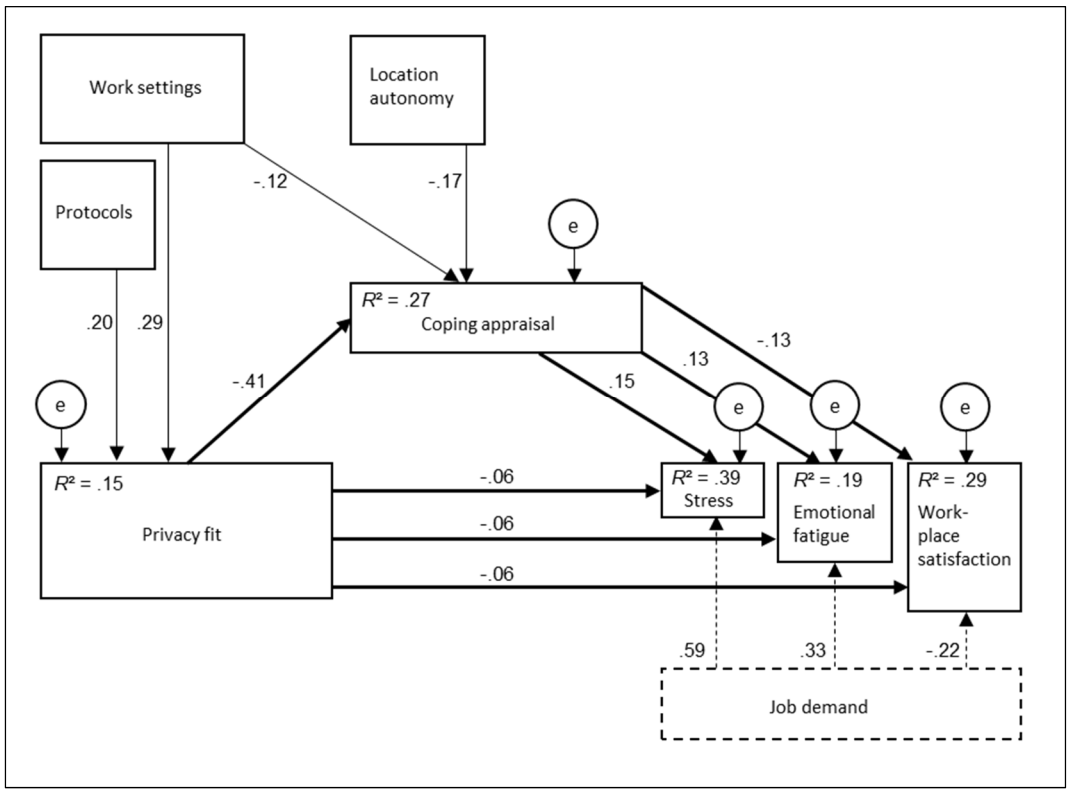


Figure 3. Results of the structural equation model.

6.6 Discussion

The aim of this study was threefold. Firstly, the study examined the effects of frequent poor privacy fit at work on stress, satisfaction, and fatigue. Secondly, the study examined the role of coping appraisal in the relationship between privacy fit and the outcome variables. Thirdly, it was examined whether environmental and social context factors in the workplace have an effect on privacy fit and coping appraisal. These relationships were tested simultaneously by using path analysis. The results showed that frequent poor privacy fit is associated with stress, emotional fatigue, and workplace satisfaction, but not with mental fatigue or job satisfaction. Further, the results revealed mediation effects of coping appraisal on the relationships between privacy fit and the outcome variables. The type of mediation varied. Coping appraisal explained all of the effect that privacy fit had on stress and

emotional fatigue, whereas the effect on workplace satisfaction was only partially explained. Lastly, results showed that the frequency of privacy fit increased when participants found their workspace to have more varied settings to support their tasks at work. Privacy fit was also higher for participants who experienced their co-workers adhering to the protocols of using the office spaces. Participants felt they had more coping options if they found their workspace to have a variety of settings. Perceived coping options were also higher for participants who had high location autonomy and were free to choose their work locations. Overall, the hypothesised model had good model fit.

6.6.1 Implications for Evidence Base & Theory

This study verified previous findings that workers who experience poor privacy fit in the office are less satisfied with the office environment (e.g. Sundstrom, 1986). Person-environment (P-E) fit, a theory largely used in occupational psychology (Edwards, 2008), lends itself to explaining this relationship. Environmental characteristics do not match the workers' requirements, in this case poor privacy fit, which is known to impact on the environment, corresponding, in this case, to dissatisfaction (cf. Furnham & Schaeffer, 1984; Ostroff & Judge, 2007).

The present study verified the scarce evidence that poor privacy fit contributes to stress (e.g. Goodrich, 1986) and emotional fatigue (Laurence et al., 2013). In order to investigate how poor privacy fit contributes to stress and fatigue, this study developed and tested a new model based on Altman's (1975) privacy regulation theory and Folkman and Lazarus's stress theory (Lazarus & Folkman, 1985). To the best of the author's knowledge, this is the first study that uses Altman's framework for quantitative research and at the same time puts a newly developed measure of privacy fit to use. The applied frequency assessment of privacy fit exposes poor fit as a continual socio-environmental demand, or disturbance factor, which the worker has to cope with on top of dealing with the demands of the job. As suggested,

frequent exposure seems to result in the depletion of emotional resources as of the consequently observed effect on emotional fatigue (cf. Frone & Tidwell, 2015).

Further, results extend past research as they suggest an explanation as to why poor privacy fit might result in stress and related consequences. Therefore, a new model of privacy fit was developed and successfully tested. The new model is unique in its understanding of privacy. It is grounded in Altman's model but incorporates an individual-focused variable originating from Lazarus's stress theory: coping appraisal. This refinement to Altman's model allows for a more precise understanding and testing of why poor privacy fit results in stress-related consequences at work. The results of this study suggest that the appraisal of coping resources is a key determinant of a stressful privacy experience as it mediates the relationship between privacy fit and stress, satisfaction, and emotional fatigue. In line with appraisal theory, coping appraisal mediated and fully explained the effect of poor privacy fit on stress-related consequences (stress and emotional fatigue), whereas reduced satisfaction levels were not fully explained by the mediation. As expected, workers only seem to experience stress and fatigue due to privacy impairment if they also believe that they cannot handle or change the situation. Although both parts of appraisal are widely regarded as interdependent, it is important to acknowledge the distinctiveness of each element according to Dewe (1991). Dewe (1991) demonstrated their distinctiveness and varying strength in predicting emotional discomfort at work. Therefore, the value of separating the assessment of primary and secondary appraisal and of observing their unique contributions to negative privacy experiences is acknowledged in this thesis.

Lastly, this study adds to the little empirical evidence that variety of settings (e.g. Flynn, 2014), protocols (e.g. Brennan et al., 2002; Hedge, 1982), and location autonomy (Robertson et al., 2008) help workers to actively meet their privacy needs in an open-plan office. In addition, this finding adds to the existing appraisal literature, as location autonomy

and variety of settings are privacy-specific contextual antecedents that increase the perception of coping options.

6.6.2 Implications for Practice

The results have implications for practitioners. Firstly, it became evident that a poor privacy fit can jeopardise psychological well-being by contributing to emotional fatigue, which is a component of burnout (Frone & Tidwell, 2015). This has financial implications. In 2009, burnout-related costs for UK employers were estimated at £28 billion (NICE, 2009). Independently of extreme cases such as burnout, the economic impact of reduced work performance due to poor psychological well-being is well established (e.g. Harter, Schmidt, & Hayes, 2002). Until now, evidence of a connection between privacy fit and psychological well-being has been limited and its wider economic impact seldom discussed.

The present study not only highlights the risks of a poor privacy fit, it also attempts to offer solutions. Based on the results, it is postulated that open-plan offices, which are designed to provide work settings for occupants' varying privacy needs (task and conversation confidentiality, limited interruptions, and limited stimulation), are occupied by more satisfied and less exhausted workers. Furthermore, it became evident that protocols, which define desired and non-desired behaviour in different office settings, make privacy regulation more successful. Presumably, protocols prevent misunderstandings and therewith privacy-related disturbances. It is assumed that achieving optimal privacy fit consistently throughout a working day is not always possible – at least not for the entire office population. As this study shows, this does not necessarily result in a detrimental impact on workers' psychological health: the impact of a poor privacy fit can be mitigated by providing workers with coping options. It became evident that location autonomy and adequate office design increase workers' perception of being able to cope with privacy issues; giving workers full

autonomy over where they work and making them aware that there are plenty of spaces they can choose from seems to be an acceptable mitigation strategy.

6.7 Limitations & Future Research

The study has weaknesses and limitations in terms of sample size and missing data, which was counteracted by consolidating two data sets from one population. Possible practical limitations that might have affected sample size and survey completion rates include survey length and participants' highly professional and demanding jobs, which could have affected participants' participation motivation respectively.

Further, the study has weaknesses and limitations in terms of study design. Participants were asked to recall the frequency of privacy needs, of achieving those needs, and the extent of coping resources, which poses a risk of recall bias. Participants might have primarily recalled events that resulted in negative affect rather than events that had little impact. Hence, a scenario in which a person's privacy was invaded but this did not result in stress as the person assessed coping assessments positively could be rare. Further, as data came from a single population, is cross-sectional in design, and based on self-report it is at risk of common method bias, which may have inflated some relations. The cross-sectional design does not allow any interpretations of cause and effect relationships between variables (cf. Lindell & Whitney, 2001; Maxwell & Cole, 2007).

Moreover, there are limitations to the analysis procedure. No account can be made for any spuriousness effects, for example due to differences in personality traits, which affect the appraisal of internal resources (e.g. internal locus of control, hardiness, optimism, and self-esteem; Nelson & Simmons, 2003). In addition, both original data sets had a significant amount of missing data. However, a high degree of precaution was taken to investigate and mitigate any biasing impact. Despite the highlighted limitations, there is sufficient evidence

that the model is conceptually viable and the interactions found in these studies strengthen the author's confidence in the results.

6.8 Conclusions & Next Steps

Despite the interest in privacy regulation in open-plan offices that dates back several decades, evidence on the psychological impact of poor privacy fit at work had been limited. Furthermore, no comprehensive work had been undertaken to explain the stress reaction and related consequences that poor privacy fit results in. In addition, this study provides evidence on how individual coping assessment as well as context factors can impact on this relationship. Despite the limitations, the findings of the study contribute to an expanding academic and practitioners' literature on privacy at work. The author is confident enough in the results of this study to suggest that open-plan offices must not be an unhealthy place to work per se, as often proclaimed. It very much seems to depend on the quality of the environment and the culture of those occupying the space, at least from a privacy perspective. This provides opportunities for future studies to quantitatively assess the direction of the relationships examined in this study, for example by means of examining the impact of changes in contextual factors on privacy fit and coping appraisal. Also, it is of interest if these changes can reduce stress-related consequences of poor privacy fit in return. Furthermore, it is of interest to examine whether the new open-plan concept of ABW, which has the previously observed contextual variables (setting variety, protocols, and location autonomy) at its conceptual core, is particularly conducive to privacy regulation. These research questions are addressed in Study 4.

7 Chapter Seven:

Study 4 – A Longitudinal Study to Assess Whether Changes in Work Environment Predict Changes in Privacy Appraisal and Associated Outcomes

7.1 Abstract

Taking a privacy fit perspective, this research was designed to examine contextual predictors of change in privacy fit and coping appraisal, as well as changes in outcomes of privacy fit during an office move. Data was collected over two points of measurement from 61 office workers who moved from a standard open-plan office to an activity-based working (ABW) open-plan office. The first questionnaire was distributed six weeks prior to the office move; the following questionnaire was distributed seven months after the move-in date. With its longitudinal design, this study extends past research by demonstrating the changing nature of privacy fit and revealing predictors of change in privacy fit and coping appraisal for open-plan office workers that move into an ABW environment. As suggested, cross-lagged autoregression analysis of change confirmed that a perceived increase in the variety of settings as well as an increase in the adherence of others to protocols positively influenced post-move privacy fit. A change in coping appraisal post-move was predicted by an increase in perceived environmental and behavioural flexibility (settings and location autonomy). Changes in privacy fit and appraisal were associated with increases in job and workplace satisfaction and decreases in emotional and mental work fatigue post-move.

7.2 Introduction

Study 3 successfully tested the newly developed model of privacy fit and appraisal. This study is used to further investigate causal explanations and causal directions between variables in a longitudinal study in a changing environmental context. This longitudinal study examines office workers who move from a standard open-plan office to an activity-based working (ABW) open-plan office.

7.2.1 Changes in Context Factors in an ABW Environment

Activity-based working (ABW) is an office strategy that encourages office workers to physically locate themselves where it is most suitable for them to complete their work rather than fulfilling all their work tasks at one setting (i.e. fixed desk or cubicle; Engelen et al., 2013). An ABW office provides workers with a choice of settings for a variety of work activities from highly concentrated individual work to unplanned informal or formal meetings. Traditionally, ABW is implemented in conjunction with desk sharing (Wyllie et al., 2012). Apart from offering a choice of settings, ABW occupants require a work culture that allows workers to take advantage of the flexibility offered. Wohlers and Hertel (2017) point out that the culture of an ABW workplace is reliant on the fact that management supports and empowers workers to work flexibly. Location autonomy requires a culture of trust in the employees' willingness to work rather than a culture of control. Although frequently suggested (Flynn, 2914; Wohlers & Hertel, 2017), little empirical evidence is available to support the usefulness in providing workers with autonomy over deciding where to pursue work tasks (Robertson et al., 2008). Konkol and Kämpf-Dern (2017) elaborate on the importance of addressing management style and leadership behaviour through change management when implementing ABW. Change management is the management of change in an organisation (e.g. Philips, 1983) and is employed in the context of workplace strategy change (Konkol & Kämpf-Dern, 2017). Further, behavioural protocols on the correct use of

the range of settings has been considered to be important in shared office environments to prevent misunderstanding and conflict (Oseland, 2009). As the introduction to ABW includes new work settings the existing protocols need to be updated, which can be addressed in the context of change management activities. It is suggested that a new ABW office will have an increased variety of settings, and improved location autonomy and protocols due to the accompanying change management program in comparison to the old standard open-plan office. The following hypotheses are suggested:

Hypothesis 1a: The variety of work settings will be rated more positively post-move.

Hypothesis 1b: Location autonomy and adherence to protocols will be rated more positively post-move.

7.2.2 Predictors of Change in Privacy Fit & Coping Appraisal

Due to the increased environmental choice in settings and environmental flexibility, it is suggested that workers will be able to regulate their privacy better, resulting in better and more frequent privacy fit in the new ABW office. Location autonomy would allow workers to make use of the new environmental flexibility and give them the flexibility to regulate their privacy unhindered. In line with behaviour setting theory (cf. Barker, 1968), it is suggested that protocols, which are adjusted to the new ABW office, increase the effectiveness of privacy regulation. For example, if colleagues adhere to refraining from contacting each other in a quiet/concentration zone, then these zones are coherent in their meaning and will likely result in others using them as intended.

As for privacy-related coping appraisal, it is suggested that the perception of having, socially and environmentally, an increased freedom to regulate one's privacy will increase one's perceived options to cope with privacy infringement. Similarly, settings coherence through protocol adherence is thought to increase one's perception of being able to control poor privacy fit. Therefore, the following hypotheses are suggested:

Hypothesis 2a: The frequency of privacy fit will increase post-move.

Hypothesis 2b: Privacy-related coping appraisal will be rated more positively post-move.

Hypothesis 3a: Changes in privacy fit over time are accounted for by changes in settings, location autonomy, and protocols.

Hypothesis 3b: Changes in privacy-related coping appraisal over time are accounted for by changes in settings, location autonomy, and protocols.

7.2.3 Changes in Privacy Fit & Coping Appraisal Relating to Changes in Outcomes

Results of Study 2.B and Study 3 suggest that privacy fit explains variance in satisfaction, stress, and emotional fatigue and indicates a relation to mental fatigue. Therefore, it is hypothesised that improved privacy fit in the new office could elevate satisfaction levels and decrease stress and fatigue levels. Further, Study 3 results suggest a mediating effect of privacy-related coping appraisal on the relationships between privacy fit and stress, fatigue, and satisfaction. Hence, it is proposed that changes in appraisal will lead to a change in these outcome variables. In examining changes in outcomes, changes in job demand ought to be controlled. It is established that job demand contributes to stress, fatigue, and satisfaction at work (cf. Frone & Tidwell, 2015), which was confirmed in the results of Study 3. Based on the above, the following hypotheses are suggested:

Hypothesis 4: Work-related outcome variables (stress, fatigue, and satisfaction) will be rated more positively post-move when controlled for job demand.

Hypothesis 5a: Changes in work-related outcome variables (stress, fatigue, and satisfaction) are accounted for by changes in privacy fit when controlled for job demand.

Hypothesis 5b: Changes in work-related outcome variables (stress, fatigue, and satisfaction) are accounted for by changes in privacy-related coping appraisal when controlled for job demand.

7.3 Study Aims

The aim of this study is twofold. First, the study aims to explore social and environmental predictors of change in privacy fit and privacy-related coping appraisal. Second, the study aims to examine whether changes in privacy fit and appraisal influence changes in a range of stress-related outcomes at work.

7.4 The Field Situation

This longitudinal study was conducted in the context of an office relocation of a global architecture and engineering company in the UK involving approximately 1,000 staff members. The original office configuration can be classified as a large standard European open-plan office occupying 1,000 staff on two floors. Staff worked at assigned or shared desks arranged by teams. Some spatial dividers, meeting rooms, and a breakout area were provided in the old office (see Figures 4–7). In comparison (see Figures 8–13), the new office was also a large open-plan office but, unlike the old office, was configured to support ABW. As mentioned before, ABW has particular requirements as regards office design and office culture in order to succeed (e.g. Engelen et al., 2018), which were both targeted during the implementation of the new office. A design characteristic of agile workplaces that was implemented in the new office is a large variety of different types of spaces (e.g. Engelen et al., 2018). These spaces should fit employees' varying requirements and preferences, which, ideally, are assessed beforehand and should ideally be of high-quality design to encourage use. Spaces ranged from informal meeting spaces and quiet booths to formal meeting spaces, project spaces, stand-up/agile meeting zones, and spaces to relax, etc. It was explained that agile working is a non-hierarchical concept and that all employees, independently of their

status, have access to all spaces. Another environmental characteristic of the new office that often goes hand in hand with agile working is democratic desk sharing for all employees, including management (Appel-Meulenbroek et al., 2011; Wyllie et al., 2012). Independently of the agile working concept, the new office layout dispersed employees across five floors that are connected with a community staircase. On the one hand, this reduces social density. On the other hand, it offers more possibilities for spatial distance between colleagues. A cultural characteristic that is recommended for agile working is adjusted protocols on setting use and an autonomous working model that gives employees the freedom to walk away from their desk to use a different work location (Engelen et al., 2018; Flynn, 2014; Oseland, 2009; Wohlers & Hertel, 2017). In order to introduce this new agile working culture, change management workshops, training sessions, and feedback sessions with staff were hosted at biweekly to monthly intervals until 12 months after the move.

Figure 4. Traditional open-plan office layout – two floors occupied.

Figure 5. Traditional open-plan office layout – team neighbourhood.

Figure 6. Traditional open-plan office layout – breakout space.

Figure 7. Traditional open-plan office layout – project space, self-build.

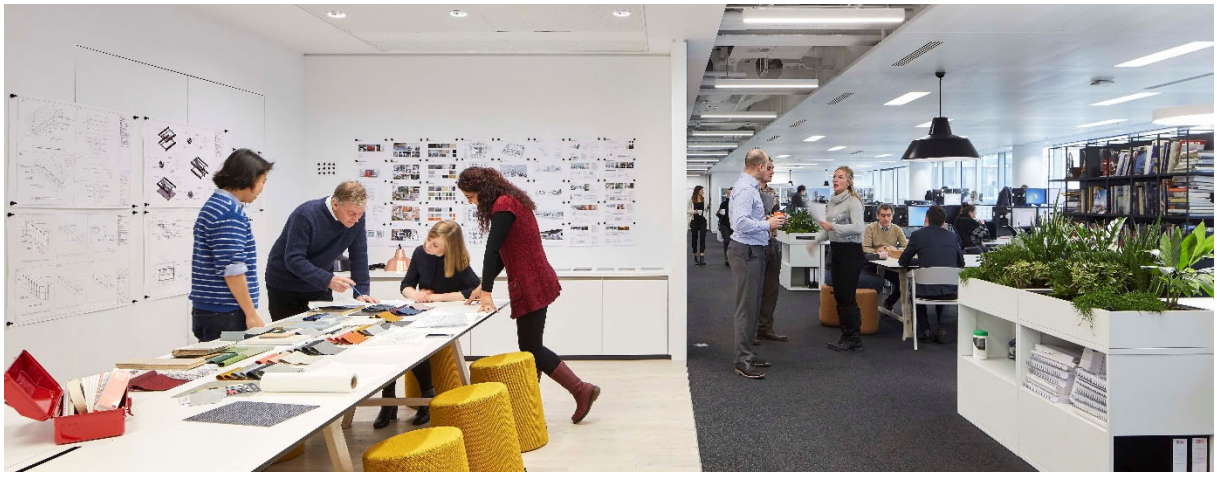


Figure 8. ABW office layout in team neighbourhood – project space.

Figure 9. ABW office layout in team neighbourhood – informal meeting spaces.

Figure 10. ABW office layout – multi-storey breakout zone and cafeteria.

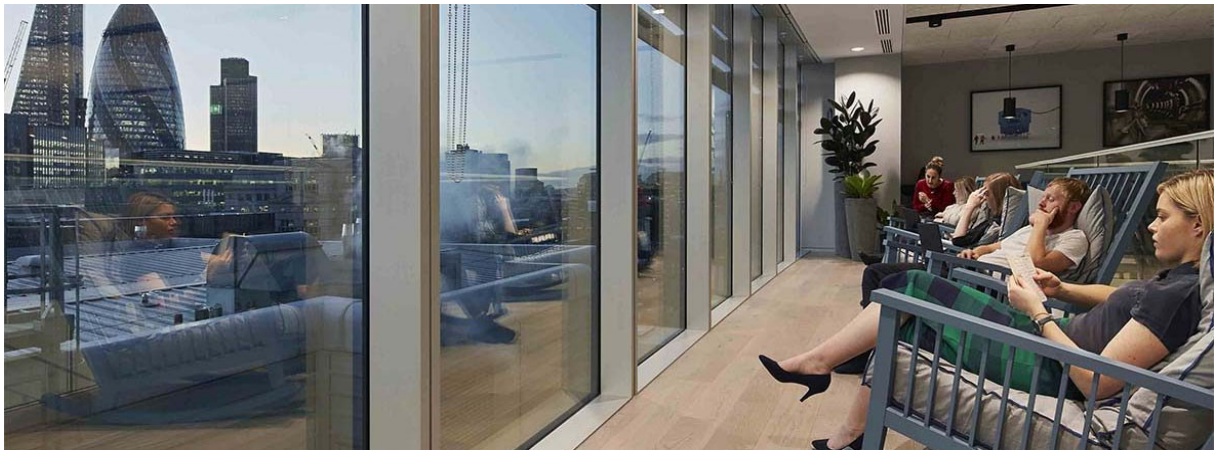


Figure 11. ABW office layout – relax spaces.

Figure 12. ABW office layout – stand-up/agile meeting space.

Figure 13. ABW office layout – various settings close to team neighbourhood.

7.5 Method

7.5.1 Procedure & Study Design

As regards the initiation of the study, managers of teams with more than five members were asked to participate and 11 managers agreed for their teams to do so (sample population $n = 479$). The first questionnaire was distributed to the selected staff population six weeks prior to the official moving date. The second questionnaire was distributed seven months after the move. Time 2 data collection was delayed after the move in order to reduce any bias, such as novelty effects or negative affect due to the change (Lütke Lanfer et al., 2017). For both data collections, team leaders distributed the link to the online questionnaire via email to 11 departments (total population $n = 479$) and followed up with three reminders over the data collection period of four weeks. Participation was fully voluntary and not required for work performance review. Participants were informed that both questionnaires were designed to capture how the changes in the environment will impact on respondents' workplace experience and specific aspects of well-being at work. All participants were informed that their responses were both anonymous and confidential, as they had not been made available to organisations' personnel at any time. At both times, participants were asked to create a respondent ID (composed of elements of their postcode, mobile number, and birthday) so that responses to both questionnaires could be matched for analysis. Due to the length of the survey, at both times an incentive was given by the company of six lottery prizes (value £50 – £75). In order to take part in the lottery, participants had to indicate their email address in a separate survey. The email addresses were at no point linked with the questionnaire responses. In terms of ethical considerations, based on the completed "Self-Assessment Form: Ethics", a submission of a full application to the University Ethics Committee was not required.

7.5.2 Sample Size Considerations

For the subsequent analysis of changes of means over time, an a priori power calculation with G*Power (Faul et al., 2007) was conducted to establish sample size requirements. For an analysis of differences between two dependent means (matched pairs) considering power (1-β) of .95, α = .05, and a one-tailed assumption, a sample of $n = 45$ is sufficient to detect moderate effects ($d = 0.5$), whereas a sample of $n = 272$ would be required to detect small effects ($d = 0.2$).

For the following panel analysis to test causal directions across time, a critical mass of data is required in order to achieve the required statistical power. A minimum sample size requirement of 200 cases was identified from the literature (Baldawin, 1989). Due to the high attrition rate in this study and the resulting small sample size (see following paragraph), causal directions across time were analysed with individual regression models. An a priori power calculation with G*Power (Faul et al., 2007) was conducted considering a multiple regression analysis with seven predictors (to test H4ab), power (1-β) of .95, and α = .05. It was indicated that a sample of $n = 70$ would be required to detect large effects ($f^2 = 0.35$) and a sample of $n = 153$ would be needed detect moderate effects ($f^2 = 0.15$). Further a priori power calculation with G*Power for a multiple regression analysis with five predictors (to test H5ab) indicated that a sample of $n = 63$ would be sufficient in detected large effects, whereas $n = 153$ would be required for the detection of moderate effects.

7.5.3 Participants

A total of 479 employees out of approximately 1,000 staff were invited to participate in the study. A total of 238 eligible questionnaire responses were collected at Time 1, which represents a response rate of 50%. At Time 2, the questionnaire was completed by 135 respondents, which reduced the response rate to 28%. A total of 85 respondents participated in both questionnaires, of which 24 were discounted because of excessive missing data (see

the following section: Preliminary Analysis: Missing records). Sixty-one longitudinal responses were retained (26% response rate in reference to Time 1). The respondents of those 61 retained questionnaires were aged between 20 and 65 years (M = 34.50, SD = 10.0). Thirty-nine per cent of the participants were female, 57% male, and 3% did not answer the question. In terms of representativeness, the sample was considered adequate regarding gender ratio (gender ratio of organisation: 65% male, 36% female; HR data, 2016), seniority (all levels of seniority were represented between 5% and 25%), and response rate of the participating departments relative to size (five departments were represented with < 10%, three were represented with 11–20 %, two were represented with 31–40 %, and one was represented with 67%).

7.5.4 Measures

The same measures were used as in Study 3. Descriptive statistics for, and correlations among the variables are provided in Table 12. In contrast to Study 3, for this study, mean composite scores were built to aid interpretation. Further, coping appraisal scores were reversed in order to aid interpretation. This means a high coping appraisal score reflects high privacy-related coping appraisal.

Table 12

Means, standard deviations, and zero-order correlations between study variables (Study 4)

	Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1.	Privacy fit T1	-1.34	4.50	-																			
2.	Privacy fit T2	-0.66	5.10	.48**	-																		
3.	C. appraisal T1	3.04	0.98	.48**	.57**	-																	
4.	C. appraisal T2	3.25	0.97	.40**	.61**	.50**	-																
5.	Stress T1	3.26	1.06	-.16	-.21	-.32*	-.05	-															
6.	Stress T2	3.33	1.03	-.13	-.25	-.12	.01	.57**	-														
7.	E. fatigue T1	2.70	1.16	-.20	-.32**	-.37**	-.07	.65**	.58**	-													
8.	E. fatigue T2	2.60	1.18	-.13	-.38**	-.25	-.21	.45**	.60**	.69**	-												
9.	M. fatigue T1	3.61	0.98	.02	-.05	-.09	.13	.47**	.44**	.66**	.47**	-											
10.	M. fatigue T2	3.37	0.97	-.12	-.37**	-.17	-.20	.33*	.54**	.56**	.65**	.33*	-										
11.	W. satisfaction T1	4.28	1.54	.17	.14	.50**	.15	-.43**	-.23	-.48**	-.36**	-.27*	-.19	-									
12.	W. satisfaction T2	5.16	1.51	.44**	.70**	.45**	.61**	-.25	-.24	-.28*	-.33**	-.05	-.32*	.21	-								
13.	J. satisfaction T1	3.51	0.74	.21	.33**	.43**	.36**	-.46**	-.20	-.48**	-.33**	-.20	-.23	.55**	.36**	-							
14.	J. satisfaction T2	3.64	0.73	.27*	.48**	.29*	.59**	-.13	-.18	-.18	-.30*	.07	-.18	.29*	.58**	.53**	-						
15.	Protocols T1	4.25	1.56	.13	.14	.25*	.22	-.11	.02	-.16	-.11	.08	.16	.21	.17	-.01	.11	-					
16.	Protocols T2	4.18	1.74	.12	.47**	.34**	.43**	-.30*	-.33**	-.24	-.30*	-.15	-.29	.28*	.44**	.39**	.39**	.21	-				
17.	Autonomy T1	4.25	1.57	.21	.26*	.32*	.53**	.04	.08	-.12	-.07	-.01	-.13	.38**	.29*	.41**	.34**	.03	.31*	-			
18.	Autonomy T2	4.09	1.63	.16	.43**	.35**	.57**	-.07	.09	-.08	-.15	-.04	-.26*	.21	.40**	.36**	.21	.03	.37**	.63**	-		
19.	Settings T1	3.46	1.44	.35**	.21	.40**	.25*	-.19	-.08	-.26*	-.21	-.09	-.10	.60**	.19	.39**	.21	.11	.15	.32*	.18	-	
20.	Settings T2	4.80	1.57	.35**	.54**	.38**	.56**	-.03	.04	-.18	-.14	-.05	.04	.30*	.62**	.25	.36**	.33**	.44**	.30*	.32*	.30*	-

Note. $n = 61$, *$p < .05$, **$p < .01$ (2-tailed).

7.6 Results

7.6.1 Preliminary Analysis: Missing Records

With regard to questionnaire completeness, only 11 were fully completed and 74 had at least one missing record. In order to establish whether records are missing completely at random, individual and aggregated Little's tests were performed on the relevant demographic, independent, and dependent variables. The results suggest that there is no relationship between missing and observed records and that records are missing completely at random rather than missing systematically, $\chi 2$ (452, n = 85) = 425.00, p = .62.

Because of the number of incomplete questionnaires, it was decided to replace missing records following established guidelines and best-practice recommendations (e.g. Graham, 2009). Questionnaires were considered if missing responses amounted to less than 5% relative to responses for each variable and the number of items in the questionnaire (Lowry & Gaskin, 2014). Therefore, 24 out of 85 questionnaires were excluded as the missing response ratio was higher than 5%. Mean imputation was chosen as the replacement method as the "mean is a reasonable estimate for a randomly selected observation from a normal distribution" (Kang, 2013, p. 404; only three out of 17 variables were not normally distributed). Artificially reduced variance and standard errors were identified as the main concern for single imputation methods such as mean substitution (e.g. Malhotra, 1987). A comparison of standard errors and variance of variables between original and replaced variables measured on five-point and seven-point Likert scales shows that data replacement had only a marginal impact: the average standard error difference between original and replaced variables was 0.01 (range 0.00–0.02), and the average variance difference was 0.02 (range 0.00–0.19). Therefore, it was concluded that data imputation did not systematically bias the sampling distribution and variability.

7.6.2 Panel Attrition and Comparison of Participants

In order to test whether the final sample consisting of all participants who completed the Time 1–Time 2 questionnaire differed from those who completed only the first questionnaire, a multivariate analysis of variance (MANOVA) was conducted. Participants who completed only the first questionnaire (n = 121) were compared to those who completed both questionnaires (n = 85) on relevant Time 1 variables (i.e. job demand, stress, workplace and job satisfaction, emotional and mental fatigue). The MANOVA revealed no significant difference at the multivariate level at Time 1, Wilks' Lambda = .95, $F(6, 199) = 1.86$, $p = .10$.

7.6.3 Changes of Means over Time

Before a detailed analysis of changes over time was conducted, a descriptive analysis of change both for the outcome variable and the predictor variables was performed. Normally distributed outcome and predictor variables were analysed by using a series of dependent t-tests whereas non-normal variables were analysed with the Wilcoxon signed-rank test).

Hypothesis 1a was supported fully as ratings of environmental variables showed significantly positive mean level changes from pre- to post-move. Work settings were perceived to be more varied (Mdn = 5.00) in the new office than in the old office (Mdn = 3.00), $z = -4.38$, $p < .001$, $r = 0.4$.

Hypothesis 1b was not supported as social variables were not rated significantly more positively after the move. Respondents did not find that their co-workers adhered more to the protocols about the correct and sociable use of different office spaces after the move despite workplace change management targeting this behaviour change. Further, the means did not change in the expected direction ($M1$ = 4.25, $SE1$ = 0.20; $M2$ = 4.18, $SE2$ = 0.22), $t(60) = 0.00$, $p = 1.00$, $r = 0.00$. Equally, respondents did not significantly experience more location autonomy in the new office ($M1$ = 4.25, $SE1$ = 0.20; $M2$ = 4.09, $SE2$ = 0.09), $t(60) = -0.87$, $p = .39$, $r = 0.11$.

Hypothesis 3 was not supported as neither privacy fit (*M1* = -1.34, *SE1* = 0.58), (*M2* = -0.66, *SE2* = 0.65), $t(60) = -1.09$, $p = .28$), $r = 0.14$, nor coping appraisal changed significantly over time (*M1* = 3.04, *SE1* = 0.13), (*M2* = 3.25, *SE2* = 0.12), $t(60) = -1.69$, $p = .09$, $r = 0.21$. However, both mean levels changed in the expected direction as they increased after the move (although insignificantly).

Hypothesis 4 was partially supported as scores for mental fatigue and workplace satisfaction significantly improved after the move. Respondents reported suffering significantly less from mental work fatigue in the new office (*M2* = 3.37, *SE2* = 0.13) than in the old office (*M1* = 3.61, *SE1* = 0.13), $t(60) = 2.23$, $p = .03$, $r = 0.28$. Respondents were significantly more satisfied with the new office (*Mdn* = 6.00) than with the old office (*Mdn* = 5.00), $z = -3.40$, $p < .01$, $r = 0.31$. There was no significant change in the remaining outcome variables: job satisfaction (*M1* = 3.51, *SE1* = 0.09; *M2* = 3.63, *SE2* = 0.09), $t(60) = -1.32$, $p = .19$), $r = 0.17$; work stress (*M1* = 3.26, *SE* = 0.14; *M2* = 3.33, *SE* = 0.13), $t(60) = -0.57$, $p = .57$), $r = 0.07$; emotional fatigue (*M1* = 2.70, *SE1* = 0.15; *M2* = 2.60, *SE2* = 0.15), $t(60) = 0.92$, $p = .36$), $r = 0.12$. However, mean levels changed in the expected direction for job satisfaction and emotional fatigue as both improved after the move (although insignificantly). As the previously outlined power calculations indicate, changes might be too small for detection with the available sample size (see 7.5.2 Sample Size Considerations).

7.6.4 Causal Directions Across Time

As a descriptive analysis of change for the outcome and predictor variables did not elicit many significant changes, a detailed analysis of changes over time was conducted to explore the relationships between variables further. To assess whether changes in contextual variables account for changes in privacy fit and coping appraisal (H4ab), and whether changes in privacy fit and coping appraisal account for changes in the outcome variables (H5ab), an autoregressive cross-lagged regression analysis (Bollen & Curran, 2006) was conducted. Statistically and methodologically, an autoregressive cross-lagged regression analysis is

preferred over regressing change scores[16] (Taris, 2000, 2008) as it is superior in examining the relationships between variables over time to understanding how variables influence each other over time (Kearney, 2017). Change scores have been noted to be less reliable than their constituent variables (e.g. Cronbach & Furby, 1970 in Taris, 2000), particularly when the constituent variables are highly correlated (for further explanation see Cronbach & Furby, 1970). Additionally, regressing change scores bears the risk of regression fallacy, which describes misleadingly accepting or rejecting the null hypothesis by "attributing the change in the criterion variables (that is presumably largely due to measurement error) to the effect of the independent variables in the study" (Taris, 2008, p. 150). Whilst in the change score approach the Time 1–Time 2 difference in Y is related to the scores on a predictor X, in the autoregressive approach the relationship between variable X at Time 1 and variable Y at Time 2 is compared with the relationship between variable Y at Time 1 and X at Time 2 (Kearney, 2017). Therewith, the directional influence that variables have on each other over time is estimated, and conclusions about causal influences between variables can be drawn (Kearney, 2017). Although panel modelling is ideally performed with an advanced statistical modelling software (e.g. LISREL), individual regression models were used due to the small sample size (n = 61).

Hierarchical regression analyses were performed by entering Time 1 scores of the dependent variable in the first block, the control variable (job demand) in the second block (for analyses on satisfaction, stress and fatigue), Time 1 scores of the independent variables in the third block, and Time 2 scores of the independent variables in the fourth block. The results show that hypothesis 4a was mostly supported as work settings as well as protocols predicted changes in privacy fit post-move, but location autonomy did not. Hypothesis 4b was mostly supported as work settings and location autonomy did predict changes in coping appraisal, but

[16] An analysis of associations between change score was conducted as well. However, due to its explained limitations only regression analysis is reported. See Appendix F for the change score analysis results.

protocols did not. Hypothesis 5a was mostly supported as changes in privacy fit predicted changes in emotional and mental fatigue, as well as job and workplace satisfaction post-move. Changes in privacy fit did not predict changes in post-move stress ratings. Hypothesis 5b was mostly supported as effects were similar to the H5a results. Changes in coping appraisal predicted changes in emotional and mental fatigue, as well as job and workplace satisfaction post-move. Changes in coping appraisal did not predict changes in post-move stress ratings. In what follows, the results of each hypothesis and accompanying regression model are explained in detail. The tables for the 12 regression models are listed in Appendix F (Tables F.2-F.13).

7.6.4.1 Hypothesis 4a: Changes in Context Variables Affecting Privacy Fit

At stage one of the regression model, Time 1 privacy fit was added to control for baselines of privacy fit before the move and to establish whether any of the hypothesised predictors caused changes in privacy fit after the move. At subsequent stages of analysis, Time 1 predictor variables were added followed by Time 2 predictor variables in a subsequent stage. For Time 2 privacy fit the total model explained 47% of adjusted variance, $F(7, 53) = 8.44$, $p < .001$. By controlling for the baselines of the outcome and predictor variables, two context variables were found to significantly predict a positive change in Time 2 privacy fit: Time 2 work settings ($\beta = .29$, $p < .01$) and Time 2 protocols ($\beta = .30$, $p < .01$). Together, they explained 26% of variance. In addition, a lagged effect of Time 1 privacy fit was found on Time 2 privacy fit ($\beta = .33$, $p < .001$) which explained 22% of the variance in the model. The lagged effect stayed significant in the final stage. From these results, it can be inferred that a perceived increase in the variety of work settings and perception of others' adherence to protocols in the new office helped participants to achieve a better privacy fit in the new office. Further, the detected lagged effect of Time 1 privacy fit on Time 2 privacy fit suggests that participants' experience of privacy fit before the move influenced their experience of privacy fit post-move.

7.6.4.2 Hypothesis 4b: Changes in Context Variables Affecting Coping Appraisal

The same process was used as described above. For Time 2 coping appraisal the total model explained 52% of adjusted variance, $F(7, 53) = 10.16$, $p < .001$. Two context variables were found to significantly predict a change in Time 2 coping appraisal: work settings ($\beta = .31$, $p < .01$) and location autonomy ($\beta = .25$, $p = .03$). Together, they explained 16% of variance. In addition, a lagged effect of Time 1 location autonomy was found on Time 2 coping appraisal ($\beta = .37$, $p < .01$). The lagged effect became insignificant when Time 2 location autonomy was added in the final stage. The rest of the total variance of the model (52%) was explained by controlling for the baseline (Time 1) of the predictor and outcome variables.

From these results, it can be inferred that the more varied participants perceived their work settings to be and the more they felt a sense of autonomy in choosing their work locations in their new office, the more positively they appraised their capacity to cope with poor privacy fit. Further, the detected lagged effect of Time 1 location autonomy on Time 2 coping appraisal suggests that participants' perception of location autonomy before the move influenced their perception of being able to cope with privacy demands post-move. However, perceived location autonomy at the new workplace seemed to have more impact on privacy-related coping appraisal in the new workplace than previous coping appraisal experiences as the lagged effect became insignificant in the final model.

7.6.4.3 Hypothesis 5a: Change in Privacy Fit Affecting Outcome Variables

The same process of regression modelling was used as described before. Five models were run, one for each outcome variable (emotional fatigue, mental fatigue, job satisfaction, workplace satisfaction, and stress). The results for each total model will be explained below.

For Time 2 emotional fatigue the total model explained 46% of adjusted variance, $F(5, 55) = 11.37$, $p < .001$. Time 2 privacy fit ($\beta = -.24$, $p = .04$) significantly explained an

additional 4% of variance in Time 2 emotional fatigue. In addition, a lagged effect of Time 1 emotional fatigue was found on Time 2 emotional fatigue (β = .61, p < .001). The lagged effect stayed significant in the final stage.

For Time 2 mental fatigue the total model explained 53% of adjusted variance, F(5, 55) = 14.42, p < .001. Time 2 privacy fit (β = -.36, p < .001) significantly explained an additional 10% of variance in Time 2 mental fatigue. In addition, a lagged effect of Time 1 mental fatigue was found on Time 2 mental fatigue (β = .56, p < .001). The lagged effect stayed significant in the final stage.

For Time 2 job satisfaction the total model explained 34% of adjusted variance, F(5, 55) = 7.18, p < .001. Time 2 privacy fit (β = .32, p = .01) significantly explained an additional 7% of variance in Time 2 job satisfaction. In addition, a lagged effect of Time 1 job satisfaction was found on Time 2 job satisfaction (β = .44, p < .001). The lagged effect stayed significant in the final stage.

For Time 2 workplace satisfaction the total model explained 49% of adjusted variance, F (5, 55) = 12.46, p < .001. Time 2 privacy fit (β = .62, p < .001) significantly explained an additional 29% of variance in Time 2 workplace satisfaction. In addition, a lagged effect of Time 1 privacy fit was found on Time 2 workplace satisfaction (β = .43, p < .01), which caused an increase of R^2 by 18%. The lagged effect became insignificant when Time 2 privacy fit was added in the final stage.

For Time 2 work stress the total model explained 50% of adjusted variance, F(5, 55) = 12.79, p < .001. Time 2 privacy fit (β = -.18, p = .10) did not lead to a significant change in the model. Additionally, the control variable Time 2 job demand significantly predicted Time 2 stress (β = .41, p < .01) and explained 18% of variance in Time 2 stress. The regression models predicting Time 2 work stress are the only models in this study in which the control variables Time 1 and Time 2 job demand caused a significant model change.

In summary, change in perceived privacy fit explained 4% to 29% of changes in workplace and job satisfaction, as well as emotional and mental fatigue but not in stress after the move. The rest of the total variances of the models (34% – 53%) were explained by controlling for the baseline (Time 1) of the predictor and outcome variables. From these results it can be inferred that after the move, respondents felt more satisfied with their workplace and job and less emotional and mental fatigue when they experienced a better privacy fit. However, stress levels did not change due to changes in privacy fit. Further, the detected lagged effects of Time 1 job satisfaction, Time 1 emotional fatigue, and Time 1 mental fatigue on their Time 2 counterparts suggest that participants' levels of job satisfaction, emotional and mental fatigue after the move were influenced by their previous experiences of job satisfaction, emotional and mental fatigue before the move. Furthermore, the detected lagged effect of Time 1 privacy fit on Time 2 workplace satisfaction suggests that participants' achievement of privacy fit before the move influenced their satisfaction with the new workplace. However, the achievement of privacy fit at the new workplace seemed to have more impact on satisfaction with the new workplace than previous privacy fit experiences as the lagged effect became insignificant in the final model.

7.6.4.4 Hypothesis 5b: Change in Coping Appraisal Affecting Outcome Variables

The same process of regression modelling was used as described before. Five models were run, one for each outcome variable (emotional fatigue, mental fatigue, job satisfaction, workplace satisfaction, and stress). The results for each total model will be explained below.

For Time 2 emotional fatigue the total model explained 46% of adjusted variance, $F(5, 55) = 11.26$, $p < .001$. Time 2 coping appraisal ($\beta = -.22$, $p = .05$) significantly explained an additional 4% of variance in Time 2 emotional fatigue. In addition, a lagged effect of Time 1 emotional fatigue was found on Time 2 emotional fatigue ($\beta = .71$, $p < .001$). The lagged effect stayed significant in the final stage.

For Time 2 mental fatigue the total model explained 49% of adjusted variance, $F(5, 55) = 12.57$, $p < .001$. Time 2 coping appraisal ($\beta = -.30$, $p < .01$) explained an additional 7% of the variation in Time 2 mental fatigue. In addition, a lagged effect of Time 1 mental fatigue was found on Time 2 mental fatigue ($\beta = .62$, $p < .001$). The lagged effect stayed significant in the final stage.

For Time 2 job satisfaction the total model explained 43% of adjusted variance, $F(5, 55) = 10.17$, $p < .001$. Time 2 coping appraisal ($\beta = .50$, $p < .001$) explained an additional 18% of the variation in Time 2 job satisfaction. In addition, a lagged effect of Time 1 job satisfaction was found on Time 2 job satisfaction ($\beta = -.42$, $p < .001$). The lagged effect stayed significant in the final stage.

For Time 2 workplace satisfaction the total model explained 39% of adjusted variance, $F(5, 55) = 8.631$, $p < .001$. Time 2 coping appraisal ($\beta = .17$, $p = .21$) explained an additional 21% variance in Time 2 workplace satisfaction. In addition, a lagged effect of Time 1 coping appraisal was found on Time 2 workplace satisfaction ($\beta = .48$, $p < .01$), which caused an increase of R^2 by 17%. The lagged effect became insignificant when Time 2 coping appraisal was added in the final stage.

For Time 2 work stress the total model explained 46% of adjusted variance, $F(5, 55) = 11.29$, $p < .001$. Time 2 coping appraisal ($\beta = .02$, $p = .85$) did not lead to a significant change in the model. The control variable Time 2 job demand significantly predicted Time 2 stress ($\beta = .41$, $p < .01$) and explained 18% of variance in Time 2 stress. As mentioned in the previous section, the regression models predicting Time 2 work stress were the only models in this study in which the control variables Time 1 and Time 2 job demand caused a significant model change.

In summary, change in privacy-related coping appraisal explained 4% to 21% of changes in workplace and job satisfaction, as well as emotional and mental fatigue but not in

stress after the move. The rest of the total variances of the models (43% – 49%) were explained by controlling for the baseline (Time 1) of the predictor and outcome variables. From these results, it can be inferred that after the move, the better respondents appraised their privacy-related coping appraisal, the more respondents felt satisfied with their workplace and job and the less they felt emotionally and mentally fatigued. However, stress levels did not change due to coping appraisal. Similarly to the findings of hypothesis 5a, the detected lagged effects of Time 1 job satisfaction, Time 1 emotional fatigue, and Time 1 mental fatigue on their Time 2 counterparts suggest that participants' levels of job satisfaction, emotional and mental fatigue after the move were influenced by their previous experiences of job satisfaction, emotional and mental fatigue before the move. Further, the detected lagged effect of Time 1 coping appraisal on Time 2 workplace satisfaction suggests that participants' previous appraisal of privacy-related coping before the move influenced their satisfaction with the new workplace. However, the appraisal of privacy-related coping at the new workplace seemed to have a greater impact on satisfaction with the new workplace than previous appraisal experiences as the lagged effect became insignificant in the final model.

7.7 Discussion

The present study was designed to examine directional relationships between variables that were found to be associated in Study 2.B and Study 3. Therewith, the study extends past cross-sectional correlational evidence (Study 2.B, Study 3, e.g. Laurence et al., 2013; Sundstrom, 1986). The study assessed longitudinal effects on privacy fit and privacy-related coping appraisal and associated stress-related consequences at work due to changes in contextual factors as a result of a move to an ABW office. To do so, an autoregression approach was favoured over regressing change scores because of its statistical and methodological superiority (Taris, 2000, 2008). Cross-lagged models, such as autoregressions, are in line with aspects of causal inference (measuring putative causes prior to the effects and thereby supporting temporal precedence of the cause; Kearney, 2017).

Therewith, the directional influence that variables have on each other over time was estimated, and conclusions about causal influences between variables could be drawn (Kearney, 2017).

An initial descriptive analysis of change on the study variables showed that after the move to the new ABW office, the variety of settings was perceived to be significantly more varied and the effect was medium to large. Perceived improvements in protocols and location autonomy were non-significant. No significant mean change of privacy fit and privacy-related coping appraisal after the move was detected. However, mean changes of privacy fit and appraisal went in the expected direction as the scores did improve. Mean changes of workplace satisfaction and mental fatigue were significant after the move and of medium effect size. Mean changes for job satisfaction, emotional fatigue and work stress were insignificant. However, the mean change of job satisfaction went in the expected direction as the scores did improve, whereas mean scores of emotional fatigue and work stress did not differ.

A further analysis between changes of the variables was conducted using autoregressive models and found support for most of the study's hypotheses. Contextual changes in the environment predicted an increase in privacy fit and coping appraisal after the move. Specifically, perceived changes in the variety of settings as well as perceived changes in protocol adherence in the new office predicted changes in privacy fit post-move. Perceived change in settings and location autonomy in the new office predicted changes in privacy-related coping appraisal post-move. Overall, these results appear to validate relationships between the studied contextual factors and privacy fit as well as privacy-related coping appraisal as found in Study 3. Results also suggest that privacy fit and privacy-related coping appraisal after the move were influenced by changes in the social and physical environment. A significantly more varied supply of high-quality work settings in combination with colleagues adhering to protocols in the new office seems to set out an ideal behaviour settings

scenario. Although, according to a descriptive analysis of change, perceived protocol adherence had not changed significantly after the move, the little change that took place was related to post-move changes in privacy fit and coping appraisal. Presumably, the new office enables workers to choose a distinct setting for a certain task in a context where there is a mutual understanding of acceptable interaction levels and forms between colleagues when using different settings. This suggests that the new office set-up helped workers to meet their diverse needs for privacy better than the old office did. These findings validate previous suggestions (Flynn, 2014; Keeling et al., 2016; Oseland, 2009) and reviewed findings (Brennan et al., 2002; Hedge, 1982) on the usefulness of setting variety and protocols in regulating interpersonal contact in ABW environments.

In relation to relationships found in Study 3, post-move change in privacy-related coping appraisal was predicted by post-move change in location autonomy. Although, according to a descriptive analysis of change, location autonomy had not changed significantly after the move, the little change that took place was related to post-move change in coping appraisal. The relationship between appraisal and autonomy is in line with related appraisal research findings on job autonomy and job stress (e.g. Prem et al., 2016). These results suggest that change management activities have made an impact and that the new office gives workers more sense of control over privacy issues due to increased flexibility. This indirectly supports previous suggestions (Flynn, 2014; Wohlers & Hertel, 2017) and findings (Robertson et al., 2008) that location autonomy is a meaningful contextual variable for privacy regulation at work. Regardless of the theoretical perspective taken, empirical evidence of the usefulness of a variety of settings, protocols, and location autonomy in ABW environments has been limited.

Privacy fit and coping appraisal changes both related to changes in job and workplace satisfaction, and emotional and mental fatigue post-move. By taking a privacy fit perspective (Altman, 1975), the results verified previous evidence (which used limited approaches to

privacy) and suggestions on these relationships (e.g. Laurence et al., 2013; Sundstrom & Sundstrom, 1986). Unlike the results of Study 3, a longitudinal effect was only found from privacy fit on stress and not from coping appraisal on stress. However, the effect of privacy fit on stress was small and as coping appraisal is a rather unconscious process, it is likely that a possible effect is too small to be detected with the available sample size.

Further, the study revealed several lagged effects, which indicates reciprocal relations. Time 1 privacy fit had a lagged effect on Time 2 privacy fit. This suggests that one's prior privacy fit experience influence one's subsequent privacy fit experience. Further, lagged effects of Time 1 job satisfaction, Time 1 emotional fatigue, and Time 1 mental fatigue on their Time 2 counterparts were found. This suggest that participants' levels of job satisfaction, emotional and mental fatigue after the move were influenced by their previous experiences of job satisfaction, emotional and mental fatigue. Furthermore, Time 1 Autonomy had a lagged effect on Time 2 coping appraisal. This suggests that one's previous experiences with having autonomy over the work location subsequently affect one's perception of being able to cope with privacy demands even if the office environment is a different one (but the worker population is the same). In addition, Time 1 privacy fit had a lagged effect on Time 2 workplace satisfaction. This indicates that one's earlier experience with privacy at work in a different environment subsequently affects one's satisfaction with a new workplace. However, as the last two lagged effects (autonomy on coping appraisal and privacy fit on workplace satisfaction) disappeared in the final stage of the models, the lagged effects are interpreted as minor. Although possible, it was not pursued to determine whether cross-lagged effects occur in both directions (i.e. whether $X1$ predicts $Y2$ and $Y1$ predicts $X2$) or the relative strength of the cross-lagged effects (Selig & Little, 2012) as this study was not set out to test reciprocal relationships. Theoretically, reciprocal relations, or transactional relations that span over time, are not unusual in people-environment studies. For example, systems theory (Sameroff, 1983) places a heavy emphasis on reciprocal relations such as those that exist

between the individual and his or her environment or context. While general accounts on reciprocal relationships exist in appraisal research (Vander Elst, Van den Broeck, De Cuyper, & De Witte, 2014), it has not been considered yet in environmental privacy research.

In line with the results of Study 2.B and Study 3, the results of this study suggest that Altman's (1975) dynamic privacy fit approach employed in a quantitative research setting is useful. From a theoretical perspective, the results of this study are important to the extent that they point to the proposed changing nature of privacy fit (Altman, 1975). Further, by taking a stress appraisal approach, this study suggestively verified the findings of Study 3, which concludes that one's individual assessment of being able to cope with poor privacy fit is related to the levels of satisfaction and fatigue one experiences. Taking into consideration the evidence of Study 3 and the current study, the usefulness of studying individual coping experiences when examining stress-related consequences of privacy becomes evident.

7.8 Limitations

The study was restricted to one particular office change process and only one sample. The field situation appears to be representative as previous evidence was replicated. Yet, generalising the results to all kinds of office changes and populations should be done with caution. A further limitation is the attrition rate. Almost 43% of participants dropped out between Time 1 and Time 2. The attrition led to a cumulative non-response, which greatly reduced the size of the final sample and the statistical power. The attrition analysis indicated that participants who completed the Time 2 questionnaire after they completed the Time 1 survey did not differ in their response pattern to those who dropped out. As acknowledged in Study 3, possible practical limitations that might have affected sample size and the attrition rate include the considerable length of the survey as well as participants' job demands. This might have impacted participants' motivation to take part in the survey at both times.

Furthermore, as environmental changes often come with other types of changes in an organisation (Steelcase, 2018), the study cannot account for any spuriousness effects. A threat

to the validity of conclusions from longitudinal studies involves retest effects and their possible inclusion of construct-irrelevant variance when participants are measured repeatedly with the same instrument. Although powerful designs exist that allow for the control of retest effects (i.e. missing-data-collection designs, Selig & Little, 2012), these type of procedures were not employed.

Although theory-driven assumptions about predictors and their directional effect on post-move privacy fit were established, the study cannot determine causal relations between variables in a manner similar to the way an experiment with random assignment can. Although cross-lagged models are in line with aspects of causal inference (measuring putative causes prior to the effects and thereby supporting temporal precedence of the cause), no statistical model can determine causal relations apart from strong theory and solid experimental research design (Selig & Little, 2012). Furthermore, putative causes could not be manipulated independently from other variables in the model, which is a reason to use caution when attempting to draw causal inference from the study. Moreover, due to the small sample size a regression approach had to be used. Hence, it was not possible to model the unique effect of several causes simultaneously, which is a fundamental aspect of causal inference (Selig & Little, 2012). However, the study results suggest causal explanations of one variable over another.

7.9 Conclusions & Next Steps

Overall, the results of the present research add to a growing body of literature investigating privacy at work and stress-related consequences. Studies 4 and 3 together highlight how individual differences in coping appraisal shape one's privacy-related stress experience at work (satisfaction, stress, and fatigue). From a theoretical perspective, the results of this study are important to the extent that they help to clarify the changing nature of privacy fit and point to relevant predictors in a changing environmental context. This

validates the usefulness of a dynamic privacy fit perspective. Further, the results add to limited evidence on the relationship between privacy and contextual factors in ABW environments. Both social and environmental contextual factors seem to be important resources when managing privacy demands. The study also raised some important questions such as how social and environmental contextual factors in the ABW environment are interrelated. This provides opportunities for a qualitative in-depth analysis of workers' associations with a range of contextual workplace factors that enable or hinder privacy fit. This is addressed in Study 5.

8 Chapter Eight:

Study 5 – The Same Environment But Different Privacy Experiences: Exploring the Impact of Contextual Factors on Privacy Fit in an ABW Office

8.1 Abstract

An exploratory qualitative study was conducted to provide a broader exploration of workers' associations with context factors that enable or hinder privacy fit in a modern type of open-plan office that is activity-based (ABW). Previous research has mostly focused on traditional types of open-plan offices (cf. Kupritz, 2000) and results on modern office concepts such as ABW are limited and conflicting (Engelen et al., 2018). Contextual factors previously identified are restricted to properties of the physical environment and some elements of the social work environment. However, it is unclear how these categories link and together form a work environment conducive to privacy fit. In this study, 22 participants who previously took part in Study 4 and had moved to an activity-based working (ABW) environment provided qualitative interview data on context factors that they associated with meeting or not meeting their various privacy needs in their new office. Half of the interviewees reported good privacy fit in the new office environment and the other half indicated in the post-move survey that they frequently struggled to meet their privacy needs. Thematic analysis contrasted the responses of these two privacy fit groups and identified a range of contextual factors that were associated with enabling or hindering privacy fit at work. These factors were grouped into four main themes: (1) the physical environment, (2) the social environment, (3) the job, and (4) the self. Relationships between these themes were explored. These findings confirm the results from Studies 3 and 4 by demonstrating the role and valence of environmental and social context factors in achieving privacy fit at work. Further, results extended past research by broadening the perspective on context factors in relation to privacy and highlighted the necessity of considering a combination of factors for

shaping a privacy-conducive work environment, rather than mainly focusing on the physical environment.

8.2 Introduction

The physical and social environmental enablers and constraints of privacy regulation in offices have been a focus of a great deal of research. Kupritz (2000) clustered these empirical findings and created a coherent model on mechanisms that support privacy regulation at work. This model distinguishes three types of regulators: environmental, social, and behavioural mechanisms. Kupritz (2000) describes in detail how the physical environmental could increase or reduce opportunities for privacy regulating behaviour. However, her accounts on social and behavioural mechanisms are much shorter and it is not always clear how the three mechanisms interact. Furthermore, the empirical accounts that informed Kupritz's model came primarily from studies conducted in the 70s, 80s, and 90s and focused on dated versions of open-plan offices. The model does not include evidence on modern office concepts such as activity-based working (ABW). ABW environments are particular in their environmental and social make-up, including high environmental variety, consciously steered social norms, and autonomous work styles (e.g. Engelen et al., 2018; Keeling et al., 2018). Hence, it has been suggested that ABW environments may increase opportunities for privacy-regulating behaviour and consequently increase opportunities for achieving privacy fit (e.g. Flynn, 2014; Oseland, 2009). A recent systematic literature review by Engelen et al. (2018) suggests that there is currently little and mixed evidence on ABW environments being conducive to privacy regulation. However, evidence being conflicting may be partly due to the lack of evidence on social mechanisms (e.g. protocols and autonomous work styles) and environmental mechanisms (e.g. work setting properties) in these studies. These social and environmental mechanisms could have introduced a great deal of variance in privacy regulators, which might explain the mixed results. Another reason for the conflicting results could be the

methodological variation and methodological weaknesses (e.g. weak measures of privacy, no control for organisations in mixed samples, small sample sizes, more advanced statistical procedures required; some studies don't give full accounts on methods, study design, or sample characteristics) of the studies as also pointed out by Engelen et al. (2018).[17]

Therefore, it is important to gain a better understanding of how environmental and social mechanisms in an ABW environment could create opportunities for privacy regulation and how the different types of mechanisms interact. This knowledge could also exemplify possible social and environmental variation of previous research that caused inconsistent results. In this thesis, the results of Studies 3 and 4 already suggest that open-plan office workers and workers in an ABW office are more likely to report good privacy fit and privacy-related coping if the environment is perceived to have a greater variety of workplace settings, if it is perceived to have location autonomy to work flexibly, and if there are clear protocols in place with regard to how workplace settings should be used.

8.3 Study Aims

The aim of the present study was to explore the role and interaction of social and environmental context factors in an ABW environment in enabling and in hindering privacy fit at work.

8.4 Method

8.4.1 Recruitment

For this study, participants who took part in the previous Study 4 were recruited. At the end of the survey discussed in Study 4, respondents were asked to provide their email address if they were willing to participate in a follow-up interview study. To protect confidentiality and anonymity, it was pointed out that email addresses were collected and stored separately to the survey responses and could not be linked. Volunteers were asked to report their self-

[17] See Section 2.3.3, Activity-Based Working: Description & Existing Evidence, for more information.

generated participant code (see Study 4 for details) to enable the researcher to identify each participant's individual privacy fit score. It was stressed that no other survey results of Study 4 were accessed. Seventy-two participants of Study 4 agreed to take part in the follow-up study of whom 22 were selected: 11 who had extremely low privacy fit scores and 11 who had extremely high privacy fit scores. In terms of ethical considerations, based on the completed "Self-Assessment Form: Ethics", a submission of a full application to the University Ethics Committee was not required.

8.4.2 Participants

To reiterate, participants worked in the architecture and engineering sector in the UK and had recently moved to an ABW office. Study 5 took place ten months after the office move. Participants were aged between 23 and 50 (M = 36.14, SD = 7.36). More females took part in the study than males (64% females). Overall, there was an even gender representation within their privacy fit group (both groups had seven females and four males). The ethnic background of the sample was mixed. Fifty-five per cent were from the UK (English/Welsh/Scottish/Northern Irish/British) and 45% were either Asian or of another white or mixed background.[18] The sample represented a variety of job roles (administration, graduate, principle, senior, associate director, and director), although the majority of participants (77%) had managerial or project-leading responsibilities. The participants came from nine different departments. They had an average tenure of 6.86 years (1–19 years; SD = 4.55) in the company. The majority of interviewees (91%) had worked in the old office building; only two participants joined the company after the move. Most of the participants (91%) had worked in open-plan environments prior to joining the company.

[18] The format of this question was taken from the 2011 UK census.

8.4.3 Semi-Structured Interview Schedule

Semi-structured interviews were guided by a schedule of ten open-ended questions (see Appendix G). The schedule opened with a warm-up section that prompted participants to discuss a typical workday and tasks when working in their base office building. Prompts were used to elicit the nature of the majority of their tasks (e.g. concentrated or collaborative) and the places where they worked on different types of tasks. The interview then moved on to the topic of privacy by asking about the participants' own understanding of privacy and by subsequently reading out Altman's definition of privacy to them. This was regarded as important in order to ensure a mutual understanding of the framing of the concept. The interviewer then asked about types and frequency of situations in which participants had a requirement for privacy. Subsequently, they were asked whether their personal privacy fit score matched their privacy experience at work after explaining the range of the fit score. The interview then addressed aspects at work that helped or hindered them in regulating their privacy at work. Prompts were used to elicit a broad range of context factors of an environmental and social nature. If applicable, participants were also asked to reflect on changes in the context factors due to the office move and their impact on privacy regulation. The subsequent two questions addressed participants' privacy regulating behaviour and appraisal in relation to stressful privacy scenarios. Firstly, participants were asked to imagine a scenario of stress in which they desired more privacy than they had – a procedure used by Dewe (1991) in his stress appraisal study. Previous research suggests that reporting on highly intense stressors would provide a more reliable report on the coping behaviour actually employed by participants (cf. Crocker, Kowalski, & Graham, 1998).[19] Prompts were used as necessary to encourage participants to consider their thought process, their reflections on their

[19] Differences in individuals' desire for privacy and individuals' appraisal of privacy-related stress were also explored in the interviews, but are not discussed in this thesis. Further, it is acknowledged that the literature has identified various forms of psychological coping (e.g. problem-focused coping, emotion-focused coping, approach coping or avoidant coping; cf. Carver & Connor-Smith, 2010). However, a differentiation of participants' styles of coping with poor privacy fit falls beyond the scope of this thesis.

coping options at the time, their feelings, and the outcomes and frequency of such scenarios. Secondly, the interview explored participants' spontaneous thoughts about 13 hypothetical events that require the use of privacy regulating behaviour. This procedure is commonly used in appraisal and coping studies (e.g. Anshel & Delany, 2001; Bengtsson, 2003) and is meant to reduce under-reporting of previously experienced stressful events (Anshel & Delany, 2001) related to privacy. The 13 scenarios were identified through the literature review and results of Study 1 (see interview schedule in Appendix G). The instructions asked the participants to mention the first thought and feelings that came to mind when hearing the scenario. If the scenario elicited negative appraisal, participants were asked about their immediate coping response to the scenario, similarly to a procedure used by Anshel and Delany (2001). The interview closed by asking for any outstanding comments.

8.4.4 Procedure

After providing informed consent and details on demographics and on the nature of their work, participants completed the semi-structured interview and were then thanked and debriefed. All participants were interviewed in a one-to-one setting in the participants' office, such as a meeting room. Interviews lasted between 21 and 80 minutes and were audio-recorded with participants' consent and transcribed verbatim using pseudonyms. The names of participants and the organisation were removed in order to protect confidentiality.

8.4.5 Analysis

The qualitative data was analysed through thematic analysis (Braun & Clarke, 2006), enabling identification of key themes. Where appropriate, these were then considered in the context of Kupritz's (2000) work on mechanisms for privacy regulation (Altman, 1975). Thematic analysis was judged to be appropriate because of the exploratory nature of the study, and the relative lack of literature on the contribution of ABW context factors to privacy regulation at work. First, interviews of participants with poor privacy fit were analysed,

followed by interviews with good privacy fit. Subsequently, codes and themes between the two groups were compared. As for the analysis steps taken, interviews were read thoroughly and repeatedly in order to become familiar with the data. Text was highlighted where it related to participants' responses to context factors that enable or hinder privacy regulation in order to generate codes regarding key concepts. After all relevant codes had been extracted, they were grouped into privacy supporting and privacy non-supporting themes and subthemes. Categories and themes were related to existing theories where applicable. Themes that did not occur commonly across transcripts but still provided insight into privacy regulation were retained. Quotations were selected to illustrate the themes and subthemes. An expanded explanation of the thematic analysis process is laid out in the method section of Chapter 4 (Study 1). The final themes and subthemes are shown in Figures 14 and 15 on the following page.

8.5 Results & Discussion

The responses of 11 workers with high privacy fit and of 11 workers with low privacy fit were collected. All 22 workers occupied the same ABW office. Associations with perceived enablers of, and barriers to, privacy regulation were grouped into four main themes:

(1) the physical environment

(2) the social environment

(3) the job

(4) the self

Each of the four main themes was associated with both enabling and hindering privacy fit. Subthemes within these four main themes revealed differences in associations between enablers of, and barriers to, privacy fit. The themes and subthemes are illustrated in Figures 14 and 15. The following sections will discuss and compare each of the four main themes regarding its privacy supporting or non-supporting associations. In addition, the last theme, (4) the self, is a linking theme. It will describe how characteristics of (1) the physical

environment, (2) the social environment, and (3) the job support or hinder the use of behaviour to achieve privacy fit. The final section of this results and discussion chapter will summarise how barriers to privacy fit are connected across context factors by drawing on experiences of participants with low privacy fit. Practical suggestions that address these barriers will be made in this last section.

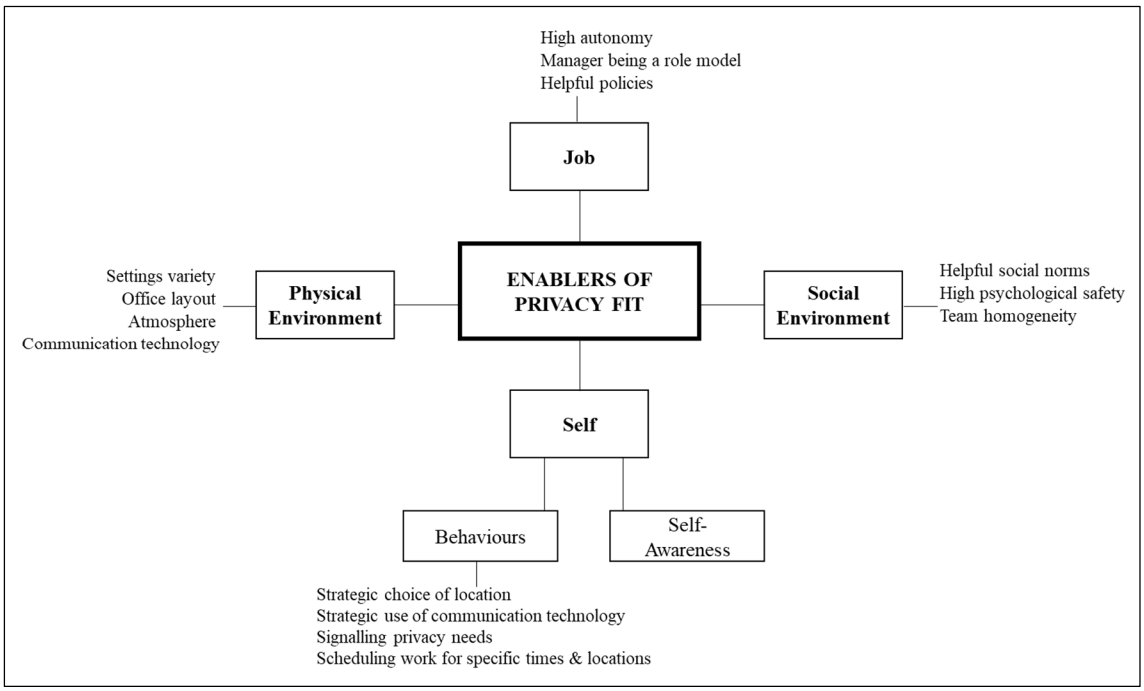


Figure 14. Themes and subthemes of qualitative associations with enablers to privacy regulation.

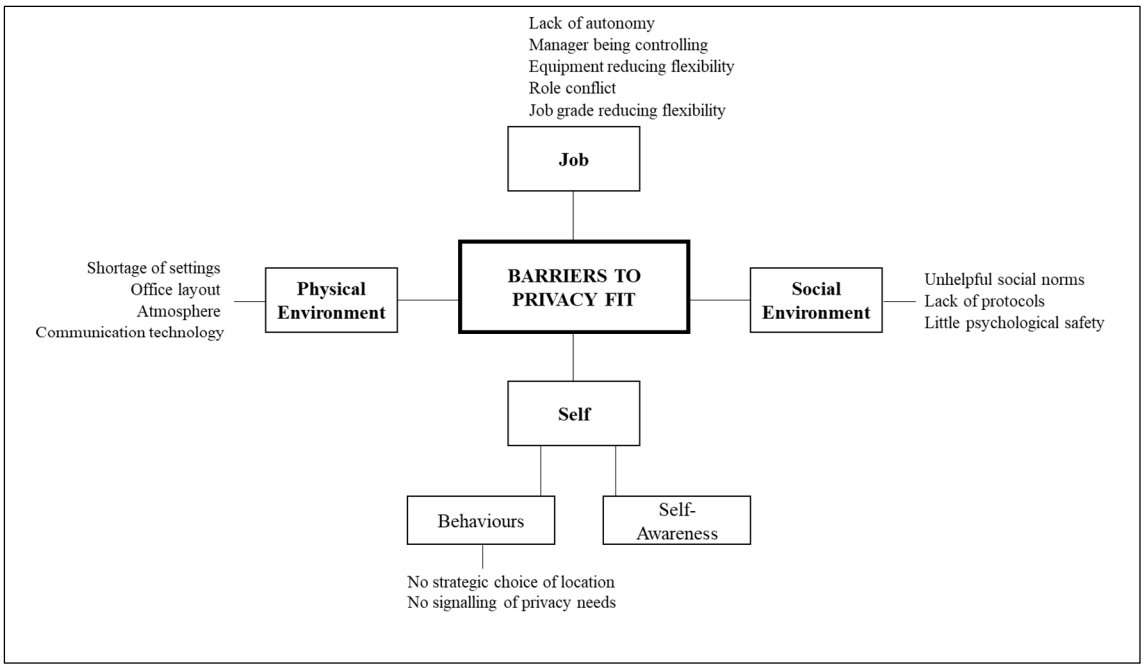


Figure 15. Themes and subthemes of qualitative associations with barriers to privacy regulation.

8.5.1 Theme 1: The Physical Environment

Participants explained how characteristics of the physical environment in the office have helped them to regulate their privacy and achieve privacy fit in the past. The characteristics of the environment that were associated with privacy are the provision of a variety of workplace settings, the office layout (meeting room location, team locations and adjacencies), atmospheric qualities (quietness and calmness), and technology to communicate (see Table 13). Participants also explained how characteristics of the physical office environment have made privacy regulation difficult. In this context, the characteristics of the environment were the shortage of workplace settings, particularities of the office layout, the atmosphere, and communication technology (see Table 14). The following section will first present associations with enablers of privacy fit that relate to the physical office environment, followed by associations with barriers to privacy fit that relate to the physical office environment.

Table 13

Enablers of privacy fit – Theme 1: Physical environment and its subthemes (Study 5)

Theme	Subthemes
The Physical Environment	1. Provision of variety of workplace settings 2. Office layout (meeting room location, team locations and adjacencies) 3. Atmospheric qualities (quietness and calmness) 4. Technology enabling communication

Table 14

Barriers to privacy fit – Theme 1: Physical environment and its subthemes (Study 5)

Theme	Subthemes
The Physical Environment	1. Shortage of workplace settings 2. Office layout (poor placement of social settings) 3. Atmosphere (high social density) 4. Technology disenabling communication (poor phone signal)

8.5.1.1 Enablers of Privacy Regulation

Four characteristics of the physical environment were identified as being associated with privacy fit. These are (1) the provision of a variety of workplace settings, (2) the office layout (meeting room location, team locations and adjacencies), (3) atmospheric qualities (quietness and calmness), and (4) technology enabling communication. In what follows, they will be discussed and illustrated with quotations.

(1) Provision of variety of workplace settings: The variety of workplace settings offered participants "lots of choice to close the (social) bubble" (N11). For example, participant N15 said:

> "There is always somewhere, a meeting room or a breakout room or collaboration space." (N15 – good fit)

Flynn (2014), Keeling et al. (2016), and Oseland (2009) have suggested that setting variety could be helpful in regulating interpersonal contact in open-plan offices, although empirical

evidence is reduced to non-peer-reviewed journals (e.g. Flynn, 2014). In the present research, participants described how the choice helped them to have various degrees of input and output to and from others throughout the workday. Using these spaces flexibly allowed them to manage their work tasks and their moods better, as for example expressed by participant N17:

> "I'm happier moving around, knowing that I have the flexibility is really, really good … I think the choice gives me something positive, it also makes me feel like I can choose who I sit next to, I can be more collaborative … I can tailor my day to where I choose to sit … I can decide 'I am doing this today, so I'll sit in this area'." (N17 – poor fit)

(2) The office layout – meeting room location, team locations, and team adjacencies: Certain characteristics of the layout of the office were associated with being supportive of privacy fit. A sufficient supply of well-distributed meeting rooms has been raised as a crucial resource for privacy. This finds support in previous research as doors in general (Sundstrom et al., 1980) and available conference rooms in particular (Kupritz & Haworth, 2005) have been found to be helpful resources for achieving privacy fit. In the present research, participants mentioned how helpful it was that meeting rooms were situated throughout the office. This helped participants to manage spontaneously occurring conversations of a sensitive nature, as explained by participants N15 and N20:

> "So here, having them (meeting rooms) spread around and you can sort of quickly look and see 'ah, there's one, nobody in that one, we'll just nip in there for two minutes', it works really well." (N15 – good fit)

> "If there is a particularly heated (conversation) … they'll wander along and go into one of the … rooms … there are quite a lot of meeting rooms around us." (N20 – good fit)

Another privacy supporting element that relates to the layout of the office was the positioning of teams in corners of the room. Positioning teams with the requirement for concentration in corners was recognised as being supportive to managing distractions. A similar finding was reported by Zeisel (1984). Corners of rooms seem to be regarded as particularly distinct

spaces or distinct territories that allow for a better regulation of social interaction (Zeisel, 1984). However, participant 16 explained how rare this set-up in his office is:

> "We're in a rare situation… we have our own corner… this pocket… the work demands so much concentration that there's no space or time for that (distractions) … you can't afford to be like that…. we're all focusing on this very high maths." (N16 – good fit)

Further relating to the layout of the office and associated with privacy fit were team adjacencies. These describe the strategic arrangement of teams that have similar work profiles and therefore similar spatial as well as atmospheric (e.g. quietness) requirements. Although some scholars postulate "functional diversity" as in mixing teams to be a fruitful design decision for organisations (Becker & Steele, 1990, p. 11), it has been recognised that well-balanced team adjacencies are an important step in the design process to prevent conflict between teams (e.g. Engelen et al., 2018; Haworth, 2016). However, empirical research on the usefulness of team adjacencies in a privacy context is lacking. For example, participant N16 said:

> "The only people I can see immediately are structural engineers … we're all having the same thought processes." (N16 – good fit)

(3) Atmospheric qualities – quietness and calmness: Atmospheric qualities were mentioned in association with concentrated work that requires little input and output from others. A quiet atmosphere in the team neighbourhood was mentioned as supporting work tasks. Previous research also identified that sound intrusion (e.g. environmental background noise and conversations) can impede privacy fit (cf. Sundstrom et al., 1994). For example, participant N16 commented:

> "the job requires lots of concentration so that's why we're quiet, the only thing you hear … is the tapping of keys." (N16 – good fit)

Further, for concentrated tasks, spaces that provide solitude and that have particular atmospheric qualities were sought out, such as being "calm", "nice", "uncluttered", and having a "clean surface" (N11, N14, and N12).

(4) Technology enabling communication: Technology was raised as an enabler of privacy fit as it allowed participants to work away from their team neighbourhood or work from home. This means they could proceed with work tasks and simultaneously attend to difficult personal matters, for example when family members were sick as described by participant N15:

> "I don't think anyone has any issues, I've got … two… who I manage, one of them whose daughter is just recovering from leukaemia … he's had time working at home, and the one his wife's just been diagnosed just started chemotherapy so he's working at home, for those sort of things … it's working really well for them … with Jabber and sharing screens." (N15 – good fit)

8.5.1.2 Barriers to Privacy Regulation

Four characteristics of the environment were identified as being associated with hindering privacy fit. These are (1) the shortage of workplace settings, (2) the office layout (poor placement of social settings), (3) the atmosphere (high social density), and (4) technology disabling communication (poor phone signal). In the following, they will be discussed and illustrated with quotations.

(1) Shortage of workplace settings: Some participants experienced a shortage of settings that were conducive to quiet work or confidential conversations. It seems that participants who were not located immediately next to meeting rooms experienced this shortage. They stated that they could not spontaneously find quiet places to concentrate and that the use of such rooms requires planning. For example, participants N20 and N12 explained:

> "Just by the nature of my job I deal with confidential projects; not being able to find a space where I can have that and feel like no one can overhear what my input might be, that can sometimes be a little tricky… it's around planning, so now if I know I've got a call about something confidential I just make sure I plan, book a room." (N20 – high fit)

> "[I]f I need to put my head down and get some work done, I cannot find a quiet space to do that in... or it's booked up ... that really bothers me. On top of that I often can't actually pinpoint which hours I'm going to use or when I actually need it, and that's what makes it really difficult." (N12 – low fit)

(2) Office layout – poor placement of social settings: One particularity of the layout that was experienced as hindering was poor placement of common areas or meeting tables. The location of these settings too close to teams that needed to concentrate created conflict (see quote by N12). Further, poor location of team adjacencies created conflict, as did teams that differed greatly in task profiles and requirements sitting too close together. For example, participants N12 and N16 explain:

> "[W]hat I find really hard to deal with then is a landscape architect opposite who is having a chat at his desk with someone else about a project he's working on … or the meeting that takes place on the round table that's behind us … it prevents me from doing what I need to do … It is probably the table behind us (landscape architects) that gets me most." (N12 – low fit)

> "[C]ertain disciplines… most of their work is talking to other people, negotiating or talking or having meetings and therefore they start having these telephone conversations and they're loud and we're sitting there going 'what are you doing, trying to focus here, what I'm doing here I really need to focus and you're just yelling down a phone'." (N16 – high fit)

(3) Atmosphere – high social density: The atmospheric characteristic that was associated with being unhelpful to achieving privacy fit was the perception of high social density. In relation to this, Oldham (1988) found in his study that perceived spatial density was associated with hindering privacy fit. In the present study, privacy impairment was associated with too much "closeness to others" (N12), and a visually and acoustically busy social environment. Participant N17 explains:

> "[V]isual and acoustic issues annoy … more noisy, there's a lot of sound permutations through open-plan areas, more densely populated, more people speaking on their phones … people having impromptu conversations, it's all about being collaborative but that has a negative impact … you just want to block that out. Visually, it's quite difficult because there's a lot going on and your eyes are sort of

> caught; if you've got a boring task that's not inspiring, your brain tends to wander." (N17 – poor fit)

(4) Technology disabling communication – poor phone signal: The main technology feature that was perceived as a hindrance to privacy fit and mentioned by almost all participants irrespective of their previous privacy fit score (Study 4) was the poor phone signal in the building, which greatly reduced participants' flexibility. As the office was purposely not equipped with desk phones, participants relied on their mobile phones for their work and private phone calls. Participant N12 explains:

> "It does have an impact because we've all stopped using our landlines, we're all using mobile telephones … the system doesn't work … The signal in the building is shit so clients can't get hold of me, so embarrassing … you hope that they call when you're not in the office." (N12 – poor fit)

8.5.2 Theme 2: The Social Environment

Participants explained how characteristics of the social environment in the office are associated with achieving privacy fit in the past. The characteristics of the social environment that were associated with enabling privacy fit are helpful social norms, a safe team culture, and team homogeneity (see Table 15). Participants also explained how the social office environment has made the achievement of privacy fit difficult. They referred to unhelpful social norms, a lack of protocols, and little psychological safety in the team (see Table 16). The following section will first present associations with enablers of privacy fit that relate to the social office environment, followed by associations with barriers to privacy fit that relate to the social office environment.

Table 15

Enablers of privacy fit – Theme 2: Social environment and its subthemes (Study 5)

Theme	Subthemes
The Social Environment	1. Helpful social norms 2. High psychological safety in team 3. Team homogeneity

Table 16

Barriers to privacy fit – Theme 2: Social environment and its subthemes (Study 5)

Theme	Subthemes
The Social Environment	1. Unhelpful social norms 2. Lack of protocols 3. Little psychological safety in the team

8.5.2.1 Enablers of Privacy Regulation

Four characteristics of the social environment were identified as being associated with achieving privacy fit. These are (1) helpful social norms, (2) helpful policies, (3) safe team culture, and (4) team homogeneity. In the following, they will be discussed and illustrated with quotations.

(*1) Helpful social norms:* The characteristic that was most often referred to in regard to privacy fit was supportive unspoken rules or social norms in teams. This is congruent with the social support element in Kupritz's (2000) framework on mechanisms supporting privacy regulation. However, Kupritz referred primarily to norms that were related to fixed desk working rather than flexible working (such as consensus on the meaning of a closed office door). In the present research, participants referred to norms that were particular for activity-based working. These included consensus on how to approach colleagues when they are busy, consensus on headphones as a cue for not wanting to be disturbed, consensus on checking their digital status if they are busy, and being generally respectful of other people's needs. For example, participants N15, N12, N20, and N14 explain:

> "If there is a bit of the team who have got a big deadline, they're actually flat out then, they'll be sort of fairly left alone." (N15 – good fit)

> "Often when people see that you have your headphones on and there's the unwritten rule in our team that you leave them alone." (N12 – poor fit)

> "On the whole, people are pretty respectful." (N20 – good fit)
>
> (On the question of whether team members respect the fact that one is busy as signalled on the internal messaging service, Jabber): "[N]ine times out of ten yes… and I do for others as well, I will still send them a message to say, '[L]ook, when you're free, I need to chat to you. Don't need to do it now' … generally most people respect what it (Jabber) says." (N14 – high fit)
>
> "You need to think in your own mind, how would that person feel about that question being asked in the open (plan) so, you know, you always ask them, '[D]o you want to talk somewhere else?' That is the easiest thing to say to someone, you know, 60 seconds." (N14 – high fit)

(3) High psychological safety in team: Participants considered a certain psychological climate in their team as being conducive to privacy fit. They explained how they could speak up freely if colleagues broke any of their team's unspoken rules that relate to privacy and that communications are transparent. This description of the team climate seems to relate to the concept of team psychological safety (Edmonson, 1999), as a key characteristic of the concept is organisational members speaking their mind freely without fearing retaliation. These associations were only observed in participants that had good privacy fit. For example, participants N20 and N11 explain:

> "If someone's on the phone … they're a bit kind of, and there's a bit of noise going on, they'll (his team members) just run around and say, '[C]an you keep it down' and that's fine." (N20 – high fit)
>
> "They (her team) seem to be quite relaxed and very happy to talk or say when things don't work." (N11 – high fit)

(4) Team homogeneity: Team homogeneity in regard to work processes and requirements seem to be highly conducive to achieving privacy fit during the workday as described by one participant (N16). It appears that this participant is working in a team that has a unique make-up and that none of the other participants work in a team with such high levels of homogeneity of work processes.

> "[T]he nature of the job and the culture … very little idle chatter… probably one per cent… We all (team) have the same thought processes…so we're all focusing on this very high maths … Don't get us wrong, we're not … curmudgeons or you know, we'll occasionally make odd quips… but other than that it's typically, you know the job requires lots of concentration so that's why we're quiet, anything you hear … I notice all I can hear is the tapping of keys." (N16 – good fit)

8.5.2.2 Barriers to Privacy Regulation

Three characteristics of the social environment were identified as being associated with hindering privacy fit. These are (1) little psychological safety in the team, (2) unhelpful social norms, and (3) a lack of protocols. In what follows, these changes will be discussed and illustrated with quotations.

(1) Little psychological safety in the team: Participant N12 in particular experienced a psychological climate that seems unsafe in the sense that team members fear retaliation when they raise the issue.

> "Is there a culture of being able to say to others, to speak openly about the behaviour being distracting? Not really, because it's not the English way of doing things." (N12 – poor fit)

> "I later got the backlash from my (boss) on that, he said, '[W]hy did you say that?' (that team members can work from home). 'I said that because it's (company name) policy'…. It's difficult… It's a huge impact obviously, the whole cultural thing is probably the most important thing and the one thing that just doesn't work." (N12 – poor fit)

(2) Unhelpful social norms: Unhelpful social norms that hindered privacy fit were raised, which referred to themselves not respecting others' cues for privacy needs such as headphones or the "do not disturb" status on the instant messenger Jabber, as explained by participant N17.

> "The 'Do not disturb' thing (on Jabber) does not work, in my opinion, because I just ignore it… So I don't think that necessarily works." (N17 – poor fit)

> "(About using headphones) it should be seen as a signal. I think that's one of the reasons that you put it on, just say '[R]ight I'm gonna block people out'. I'm not sure people get the signal, and equally, it's not just how people interrupt me, it's also about

> how I interrupt people. I know that I go and talk to people who have their headphones on because I need to ask them a question… and I don't necessarily care that they're listening to music and so a similar thing applies to me I guess." (N17 – poor fit)

Others reported that cues that are respected in their teams were overseen or not respected by colleagues of other teams. Participants N12 and N16 explain:

> "When people see that you have your headphones on … there's a rule in our team that you leave them alone. But that doesn't stop other people from having a meeting right next to me and it goes through your headphones." (N12 – poor fit)

> (A team having a meeting close to a team that was concentrating): "They should have done (moved away) … but they didn't. The longer it went on the more you could see the atmosphere was getting more and more … it was like 'come on!'" (N16 – good fit)

(3) Lack of protocols: The unhelpful social norms relate to the lack of protocols or agreed rules in some teams on how to use the office space and particular settings correctly in order to prevent misunderstanding and conflict (e.g. Oseland, 2009). This was particularly evident when participants talked about sensitive information that was shared in the open. This relates to findings by Steel (1986), who reported that accepted conversation and discretion on the part of others are examples of social support that implicitly cues what people should do and not do in a work setting (cf. Kupritz, 2000). In the present research, conversations that relate to work content, such as salaries, could have been prevented from being shared in the open if clear protocols were in place that outlined how to behave in this scenario. Often participants justified this behaviour with a lack of time. Participants N12 and N17 explain:

> "Sometimes… you do have time to see if you can take that person somewhere … and sometimes it just happens right there out in the open, well tough shit." (N12 – poor fit)

> "The problem is that sometimes you are so busy and you don't recognise if it needs to be done in a private setting… It happens on a regular basis … because even in the office where we are putting together bids, other members of the team … will come to you and ask for someone's salary, and they'll ask you at your desk … nine times out of ten, people give them the answer … they'll probably say it out loud… that happens regularly." (N17 – poor fit)

8.5.3 Theme 3: The Job

Participants explained that certain characteristics of their job helped them to achieve privacy fit in the office. These aspects are (1) high autonomy, (2) managers being a role model, and (3) helpful policies (see Table 17). Other participants explained that certain characteristics of their job hindered them from achieving privacy fit in the office. Aspects related to their job that were experienced as hindering privacy fit were (1) a lack of autonomy, (2) unsupportive management style, (3) equipment requirements hindering flexibility, (4) role conflict, and (5) one's job grade reducing flexibility (see Table 17). The following section will first present associations with enablers of privacy fit that relate to the job, followed by associations with barriers to privacy fit that relate to the job.

Table 17

Enablers of privacy fit – Theme 3: The job and its subthemes (Study 5)

Theme	Subthemes
The Job	1. High autonomy 2. Manager being a role model 3. Helpful policies

Table 18

Barriers to privacy fit – Theme 3: The job and its subthemes (Study 5)

Theme	Subthemes
The Job	1. Lack of autonomy 2. Manager being controlling 3. Equipment requirements hindering flexibility 4. Role conflict 5. Job grade reducing flexibility

8.5.3.1 Enablers of Privacy Regulation

Three characteristics of the job were identified as being associated with supporting privacy fit. These are (1) high autonomy, (2) managers being a role model, and (3) helpful policies. In the following, these aspects will be discussed and illustrated with quotations.

(1) High autonomy: Associated with achieving privacy fit is participants' level of job and location autonomy. Job autonomy can be defined as "a practice ... to give employees increasing decision-making authority in respect to the execution of their primary work tasks" (Leach et al., 2003, p. 28). Kanter (1993) suggests that job autonomy is a structural empowerment that directly affects workers' level of control (Lin et al., 2013). Location autonomy, which is suggested to be strongly related to job autonomy, refers to employees' ability to choose their preferred work location in the office rather than just sitting in sight of one's manager. There is no established term to describe this variable. There is only a little empirical evidence on job and location autonomy supporting privacy (Robertson et al., 2008), which is validated by the present research. Participant N11 explained how the level of autonomy she has allowed her to change her personal approach to a work task and the work location autonomously, as the environment and its levels of input and output did not support the task at hand:

> "There was a big piece of work to do, the first big unusual bidding process that we did and it was really difficult to find time, space, people … so, we would book out, we had tables, collaborative tables in the middle of the space but there was still… I really needed to come home and write it out, it wasn't happening." (N11 – good fit)

(2) Managers being a role model: It became apparent that managers could set a precedent in using these helpful social rules or helping them to be acted upon. The literature supports the importance of managers that role-model certain behaviours to facilitate behaviour change (e.g. Schaubroeck, Lam, & Cha, 2007; Sperber, 2017; Thompson, 2018). Participant N14, who is a manager himself, saw it as part of his job to be a role model in terms of displaying autonomy as well as being mindful of other people's needs:

> "You have got to set the precedent, you behave in a way that you want others to behave in as well and I think that is important... we've tried to communicate it (how to use settings and be mindful of others) as much as we possibly can across the team so that people are aware of it … people should try all the time to do that, the more it happens the better the behaviours become…You know, I'd like to think the directors practise what they preach." (N14 – good fit)

In addition, participant N17 explained how the level of location autonomy changed once his manager became a spokesperson for flexible working.

> "Partly the environment but also the fact that my boss led the initiative to say 'we've all got to sit next to different people', it was quite empowering and quite refreshing … I can now sit next to her or sit next to someone else and yeah it's much better." (N17 – poor fit)

(3) Helpful policies: Participants mentioned formal policies helping them or their team members to achieve privacy fit. This is congruent with the policy element in Kupritz's (2000) model on mechanisms supporting privacy fit achievement. For example, participant N15 referred to his two team members who act on the working from home policy as being with their families during times of illness.

> "I've got a member, well the two… who I manage, one of whose daughter is just recovering from leukaemia so he's … had time working at home, and one whose wife's just been diagnosed and just started chemotherapy so he's working at home, for those sorts of things." (N15 – high fit)

8.5.3.2 Barriers to Privacy Regulation

Five characteristics of the job were identified as being associated with hindering privacy fit. These are (1) a lack of autonomy and (2) managers being controlling, (3) equipment requirements hindering flexibility, (4) role conflict, and (5) one's job grade reducing flexibility. In what follows, these aspects will be discussed and illustrated with quotations.

(1) Lack of autonomy & (2) Managers being controlling: Participant N12 experienced a controlling manager that denied her the autonomy to work as and where she would prefer:

> "When I come into the office… I need to make sure that my boss sees me, because my boss does have a certain attitude he wants to see otherwise he gets rather distrustful that you're actually working. So, I go and find a spot right next to him… I will tell anyone to go work from home whenever they can … My boss finds it very hard. And he will ask them what they've been working on and dadadada, and will start meddling in my projects… I later got the backlash … he said, '[W]hy did you say that?', 'I said that because it's (company name) policy' … It's difficult." (N12 – poor fit)

(3) Equipment requirements hindering flexibility: Functional elements such as requirements for equipment were mentioned as reducing flexibility and thereby hindering privacy fit. Participants N12 and N13 explain:

> "Sit at my desk… because I need to use double screens to do my work, if I move to, like, the cafe, Grocer [name of inhouse café] … it's not very convenient for me…one small laptop is not very good." (N13 – good fit)

> "(When) I'm reviewing reports, and … I'll have four piles of paper around me going through them, … I would have to pick up all my pens, all my paper, my telephones, my headset, my laptop and my coffee cup… to remove yourself for two hours while you review." (N12 – poor fit)

(4) Role conflict: Some participants with managerial responsibilities described role conflict. Role conflict is defined as "incongruity of the expectations associated with a role" (Van Sell, Brief, & Schuler, 1981). Several types of role conflict have been identified in previous research (intra-sender, inter-sender, person-role, inter-role conflict, and role overload; Van Sell et al., 1981). The investigated type of role conflict falls into the category of person-role conflict as participants expressed incompatibility between the expectations held by managers and the expectations otherwise associated with their role (Van Sell et al., 1981). Participants had expectations of their role, which hindered them from removing themselves. Most of the participants that expressed a role conflict had poor privacy fit. Participants N12 and N17 explain:

> "If I'm not physically with them (her team) often what happens is they'll either write me an email … and the situation goes out of control, so … I have to be here and I have to be approachable when I'm here." (N12 – poor fit)

> "Because you're at work to work and you have to be open to people approaching you and asking you questions." (N17 – poor fit)

(5) Job grade reducing flexibility: Related to role conflict but in contrast to what was expressed by participants 12 and 17, participant N14 speculated whether a senior role would allow more freedom to move away than a graduate role.

> "I'm fortunate … I hold quite a senior position … I have more freedom to do that where maybe some more of the graduates to junior people in the team don't feel like they have that freedom. But they should… imagine you're a graduate you're starting a new job, 'I've got a new job, fantastic, I've got to prove myself, the last thing I want to prove is I'm never around but I'm doing my work'. It is difficult to achieve that in any organisation … I think, you obviously should be judged on your performance and what you're doing and the outputs of that." (N14 – good fit)

8.5.4 Theme 4: The Self

The last theme, "the self", has two superordinate subthemes. The first superordinate subtheme captures the psychological state of being self-aware that supported participants in managing their privacy requirements in the office (see Table 19). The second superordinate subtheme captures the explicit use of behaviours to achieve privacy fit. In that part, it is explored how the previously described characteristics of the physical environment, the social environment, and the job enable participants to employ different behaviours to achieve privacy fit or hinder them from doing so (see Table 20). The following sections will first present associations of self-awareness with enabling privacy and how the lack of self-awareness can be associated with hindering privacy fit. This will be followed by a discussion on individuals' behaviours in achieving privacy fit that are supported by contextual factors, followed by behaviours that are hindered by contextual factors.

Table 19

Enabler of & barrier to privacy fit – Theme 4: The self and its subtheme (Study 5)

Theme	*Subtheme*
The Self	1. Self-awareness

Table 20

Behaviours influenced by context factors – Theme 4: The self and its subthemes (Study 5)

Theme		*Subthemes*
The Self	1. Behaviours supported by context factors	1. Strategic choice of locations 2. Strategic use of communication technology 3. Signalling privacy needs 4. Scheduling work for specific times and locations
	2. Behaviours hindered by context factors	1. No strategic choice of locations 2. No signalling of privacy needs

8.5.4.1 Enabler of & barrier to privacy regulation – Self-Awareness

Self-awareness has been defined as a temporary psychological state when one's attention is directed inward toward the self, rather than outward toward the environment. Self-awareness describes the temporary inward "focus on thoughts, feelings, or motives" (Buss & Scheier, 1976, p. 463, referring to Duval & Wicklund, 1972). Individuals who described using behaviours successfully to achieve privacy fit (see also next subtheme on behaviours) displayed a certain awareness about their own characteristics and weaknesses, and how to manage them in the open-plan office. These were primarily participants with high privacy fit. Participants described situations in the office when they displayed self-awareness and how they then used behaviours to achieve privacy fit. When describing these situations, participants referred on the one hand to their awareness about how much social interaction they required in the moment. On the other hand, they referred to their awareness about certain individual traits that required conscious management during the situation. They described how their self-awareness allowed them to manage themselves around others and how it motivated the use of certain privacy regulating behaviour. When elaborating on these situations, these individuals pointed out that they see the management of these personal traits and requirements as a personal responsibility and a part of their job. Participant N11 in particular seemed to have an insight into how to manage herself in the open-plan office:

> "If I had to write a very long report … I could do it here but I'd be very tempted to kind of be distracted by people and go around and talk, it's just because of the kind of person I am and the kind of work I do….I just think it's my mind, my mind works better when it's plugged away from people, I get very easily distracted… I think, it's an individual thing… I love interaction, and it's the whole point of my…work…physically not see other people, because what I tend to do is, if I see somebody, and I want to talk to them, I'll go and talk to them, and so it's managing my own mind." (N11 – good fit)

Also, participant N14 explained situations in which he displayed self-awareness. He explained how he acted proactively on his needs and moods. He also stressed that he regards this as a given (to register one's needs and to act on them). He appeared surprised when he learned during the interview that not all interviewees were able to achieve a good privacy fit in the office:

> "Match your mood … have to factor that in, because … you may have come back (from a client meeting) … which hasn't gone so well, and you don't want to bring that anger in some ways into the office … So, you might want to go to a coffee shop, relax for ten minutes, understand what's happened, see how the best … get everything aligned." (N14 – good fit)

> "A lot of it is ad hoc, a lot of it is people coming up to you, it's not in your calendar … there's absolutely no way you can design an environment that allows you to capture all those nuances, so that's the point … about individuals taking responsibility to seek out the right type of space to do their work, at the same time have the ability to stop somebody, 'let's find somewhere to go to talk about this'." (N14 – good fit)

> "So that's the point back being to what I said about individuals taking responsibility to seek out the right type of space to do their work… to match their mood… What does everybody else do then?! (laughs) Just stick and say, 'argh I can't concentrate, it's not private' and not think 'I can use my two legs and get up and walk away', interesting… They're not free, that's what they need to be, they need to be free. Oh dear." (N14 – good fit)

In contrast, some participants explained that they had difficulty in "registering" (N17) a mismatch between their own needs and the environment. The narrative of participant N17 in particular suggests reduced awareness in these situations, particularly when he is caught up in

"busy work". He also points out that more awareness could help him to manage his privacy needs better.

> "The problem is that sometimes you are so busy and you don't recognise." (N17 – poor fit)
>
> "There are times when I should just say, '[R]ight, headphones on, move somewhere else, turn Microsoft Outlook off'." (N17 – poor fit)
>
> "I think I should be better, I need to be better at removing myself. I don't think I remove myself often enough … when you get really busy often that's the last thing on your mind." (N17 – poor fit)

8.5.4.2 Behaviours Enabled By Context Factors

The following section explores how characteristics of the physical environment, the social environment, and the job support the use of behaviour to achieve privacy fit. Participants referred to four behaviours or strategies that they used to regulate their privacy in the office. Some of these behaviours are enabled by the physical environment due to the provision of settings and equipment, other behaviours relate to the social environment or the job as these allow for the use of regulating behaviours (see Table 18). Privacy regulating behaviours that are enabled mainly by the physical environment are: (1) strategically choosing a location that fits participants' tasks and needs best and choosing settings that offer different degrees of connectedness to others; and (2) strategically using the communication technology provided by the organisation. Privacy regulating behaviours that mainly relate to the social environment are: (3) signalling privacy needs. A behaviour that is particularly enabled by the job and the management style is (4) scheduling work for specific times and locations.

Previous research, such as Kupritz's (2000) model on mechanisms that support privacy at work, has also identified behavioural mechanisms that "people use to modify the environment" (p. 53). In line with the present results, Kupritz (2000) listed the strategy to (1) seek out or change settings to control social interactions (e.g. closing a door, rearranging furniture to shield oneself from others) and to (2) signal the need for privacy with territorial

markers as a non-verbal mode of communication. However, Kupritz's (2000) behavioural accounts relate to old versions of open-plan offices, which are characterised by a different environmental (desks are owned, little spatial variety) and social (little flexible working) context. Recent research on privacy regulating behaviours in ABW environments by Keeling et al. (2015) identified similar strategies to the ones in this study. However, Keeling et al. (2015) do not present in-depth information on these strategies (no provision of quotes), nor were links between these strategies and the work context presented. In the following, the four strategies identified in the present research will be discussed and illustrated with quotations.

(1) Strategically choosing locations:

The majority of participants described getting up and changing the setting as their way to gain privacy. Changing settings to control social interactions has been reported before (e.g. Flynn, 2014; Keeling et al., 2015; Kupritz, 2000). Some research identified the specific use of settings of intimate, anonymous or solitude providing qualities (will be further explained below). However, much of this work has appeared in non-peer-reviewed studies (e.g Flynn, 2014). In addition, previous research explored very little how these behaviours are connected to other context factors than the environment. The current study exemplified through the previous discussions on characteristics of the physical environment (theme 2) that the provision of a variety of settings allowed participants to choose various locations to match their desired level of connectedness with others. However, the previous discussions about the job (theme 3) also made it clear that workers require a certain level of autonomy, support from their managers, and ideally policies that allow them to work from different locations within or outside the office. Lastly, discussions about the social environment (theme 2) showed that even when the physical environment (e.g. a setting) matches one's required level of privacy, the social environment might not match one's needs in terms of connectedness. For example, previous discussions on unhelpful social norms or a lack of protocols showed

that colleagues might invade one's privacy irrespectively of the physical environmental conditions.

As for privacy regulating behaviours of choosing locations strategically, participants explained that depending on the required level of input and output, settings with intimate or anonymous qualities or that provided solitude or refuge and prospect were chosen. For example, intimate settings were meeting rooms that are out of sight of team members or settings that are outside of the building. These places were chosen for sensitive conversations, mostly face-to-face but also over the phone. For example, participants N20 and N14 explain:

> "We generally tend to have difficult discussions out of the office, pubs work really well." (N11 – good fit)

> "If I am speaking to someone else, privacy is sometimes visual, so if I took somebody into a room on level seven (where his team sits) to talk about something, chins may wag, you know, "[W]hy are they speaking to that individual?"… I generally try and book a different room, or when I'm doing, let's say, someone's PDR (job appraisal), I typically take that individual to a coffee shop to have that conversation… you want to do that away from other people's eyes and ears and choose the right environment for their mood, you know, it's always about the privacy aspect." (N14 – good fit)

Anonymous settings included the internal café (Grocer), or a work setting in a different team, ideally on a different floor. These places were chosen when participants wanted to "hide" (N14) and be temporarily non-accessible to their team members. Some used these settings as well for personal phone calls as explained by participant N14:

> "If it's a PQQ or an ITT (mentally taxing) … I can't do that in the open … I'd go and work on a different floor … somewhere where I just don't find anybody else in my team to distract me, so it's actually not the … noise, (it's) the distraction of people I work with and I'm trying to get away from." (N14 – good fit)

> "I could take a private phone call with the doctor quite easily … in the Grocer [name of inhouse café]… nobody's really going to listen to what I'm saying when I'm sitting in the corner when there's a lot of background noise." (N14 – good fit)

The settings that were mentioned as providing solitude were mostly meeting rooms or the home. These places were chosen when participants had to work on a cognitive taxing task that

allowed for no distractions or interruptions or tasks that are confidential. For example, participants N20, N14, and N12 explain:

> "If I've got … something confidential I just make sure I plan, book a room." (N20 – good fit)

> "Yeah, I'd either book a quiet room, a two-person room or a meeting room, whichever's available. Or … I'd work at home, depending on what the rest of the day is set up like." (N14 – good fit).

> "I postpone stuff to the next day, if I'm at home the next day ... if I'm at home I try to maximise when I'm reviewing or things like that." (N12 – poor fit)

The settings that were mentioned as providing prospect and refuge were those in which participants had the ability to see (prospect) without being seen (refuge) (cf. prospect and refuge theory, Appleton, 1975). These included settings that were "cornered up" (N11) with one's "back against a wall and no one can peek round your shoulder" (N17). These places were chosen when participants were working on confidential information and wanted to be aware when approached. Participant N17 explains:

> "Some of the stuff I look at is quite commercially sensitive … like people's salaries or security clearance stuff, I wanna sit there so … I can see if someone's around the corner and approaching me." (N17 – poor fit)

(2) Strategically using communication technology: Previous discussions about characteristics of the physical environment made it clear that the provision of communication technology allowed participants to work flexibly from various locations. However, participants' narrative also made it clear that these communication technologies require strategic management. Participants referred to situations in which virtual social interaction via these technologies requires regulation or reduction. Participant N17 explains:

> "Email alerts, Link, Jabber alerts, all of these things are distractions. You know, unless you're strong enough to … switch them off, then there will continue to be distractions." (N17 – poor fit)

(*3) Signalling privacy needs:* Participants referred to behaviours that link to the social environment at work, such as signalling one's need for privacy to colleagues. Signalling one's need for privacy has been mentioned by some participants, who reported working in a team in which they felt safe to voice their opinions (psychological safety; see Theme 2: Social Environment). Previous research also identified the strategy of signalling privacy needs to colleagues (cf. Kupritz, 2000). Verbal modes of communication were identified, such as voicing one's needs, as well as non-verbal modes of communication such as body language (e.g. Altman, 1975; Altman & Chemers, 1980). In the present research, signalling one's need for privacy has also been found to take various forms, for example using headphones to signal privacy needs as a non-verbal form of communicating privacy needs (see Theme 2: Social Environment), or actively managing others by speaking up (e.g. N11 and N20) as a verbal form of communication. The latter can also be seen as a reinforcement of social norms. This was particularly evident when colleagues were "reminded to keep it down" (N20). Participants explain:

> (Talking about raising the issue that others' behaviour is disturbing) "I've certainly always said what I thought." (N11 – good fit)
>
> "I don't find it difficult at all (to remind others that they are annoying)." (N20 – good fit)

(4) Scheduling work for specific times and locations:

Participants also referred to behaviours that are primarily enabled by their level of job autonomy, the style of their management, and by helpful policies. These behaviours include the strategic scheduling of work for specific times and locations. Participants explained that they schedule cognitively taxing tasks for days when they work from home (e.g. N17), or plan ahead and book a room for these tasks (e.g. N20 and N14). Participants explain:

> "I try to work from home one day a week and I'll try and save up writing reports … when I don't need to be sitting and talking to other people." (N17 – poor fit)

> "If I've got a call about something confidential I just make sure I plan, book a room." (N20 – good fit)

> "Either book a … room … or I'd work at home, depending on what the rest of the day is set up like. So, if I had to be in the office to do … face-to-face meetings or proposal reviews in the morning, then I would probably find a different space in the afternoon to do that proposal writing, but if there are conference calls then I would probably stay at home and do the work at home." (N14 – good fit)

8.5.4.3 Behaviours Disabled By Context Factors

The following section explores how characteristics of the physical environment, the social environment, and the job hinder the use of behaviour to achieve privacy fit. These results seem to extend past research as the prevalent reviews by Kupritz (2000) and Engelen et al. (2018) as well as industry research (e.g. Flynn, 2014) do not specifically address how context factors can hinder the use of privacy regulating behaviour. In the current study, participants referred to two behaviours that they specifically did not use to regulate privacy in the office, although they recognised their usefulness. These were (1) not to signal privacy needs, and (2) not to choose locations strategically. Particularly participants with poor privacy fit expressed a hindrance in acting on their needs. In the following, these behaviours will be discussed and illustrated with quotations.

(1) No signalling of privacy needs: The interviewees' narratives suggest that there may be factors of the social environment associated with participants' hindrance in signalling their needs for privacy. For example, an unsafe team or organisational culture might not allow individuals to speak up on their needs. Further, these cultural norms could also extend to the wider cultural context. Participants N12 and N16 explain:

> "Is there a culture of being able to say to others that speaking openly about the behaviour is distracting? Not really, because it's not the English way of doing things." (N12 – poor fit)

> "You can't go up to them and ask 'can you stop doing that?' because that's basically telling them 'can you stop doing your work?' … No, no, because you don't want to

> disrupt their business you see, even though they're disrupting yours." (N16 – good fit)

(2) Not choosing locations strategically: Some participants clearly state that they do not choose work locations strategically that are mostly associated with their job. Some explained this by their managers being controlling and not having enough autonomy to do so (N12). Others expressed a certain role conflict that prevented them from removing themselves (N12). Others did not give a clear indication as to why they do not act on their privacy needs and choose a different work location despite their awareness that their strategies do not support themselves (N17):

> "I need to make sure that my boss sees me …, he wants to see otherwise he gets rather distrustful that you're actually working." (N12 – poor fit)

> "If I'm not physically with them (her team) …the situation goes out of control … I have to be here and I have to be approachable when I'm here." (N12 – poor fit)

> "Often I have to put my headphones on, but you can't stop people coming and talking to you … what I don't do at that point is take my laptop and go and sit somewhere where nobody knows me, which is what I should do… (On a follow-up question as to whether it is unusual for their team to move flexibly): No, not at all, no, our team… (is) more open to new ways of working … It is something I could do, I just need to get into the habit of recognising that and acting on it." (N17 – poor fit)

8.5.5 Summarising Barriers to Privacy Regulation & Practical Suggestions

In what follows, a summary will be given on the most apparent barriers to privacy fit and how these are connected across context factors. It will be drawn on experiences of participants with low privacy fit. Practical suggestions addressing these barriers will be made. From the interviewees' narrative, it became apparent that most participants with poor privacy fit did not act on their privacy needs because they felt hindered from doing so. One prominent barrier to using behaviours to achieve privacy fit was the characteristics of one's job**,** such as a manager that undermined one's right to autonomy (see Theme 3: The Job). This finding extends past research on contextual factors, which has so far primarily concentrated on social

and physical context factors (cf. Kupritz, 2000). Reduced autonomy was particularly apparent with participant N12. She also expressed environmental barriers (not enough quiet spaces, or poor placement of social settings in the office; see Theme 1: The Physical Environment) and unhelpful social norms (neighbouring team being disrespectful; see Theme 2: The Social Environment). However, she identified the lack of autonomy as "the most important thing and the one thing that just doesn't work". Potentially, environmental barriers and unhelpful norms would be less impactful on her if the management style of her superior was more conducive to flexible working. Recent theoretical works on ABW postulate that job and/or location autonomy is an important element of ABW (e.g. Flynn, 2014; Wohlers & Hertel, 2017). Other theoretical works on privacy suggest that location autonomy is important when working in an open-plan office (e.g. Oseland, 2009). However, peer-reviewed evidence on the role of location autonomy in an ABW office is scarce. Available evidence either stems from industry research (Flynn, 2015) or primarily focuses on properties of the physical (e.g. Engelen et al., 2018; Kupritz, 2000); contextual factors relating to job design have been of little focus. Job autonomy is a core dimension of job design in prevalent job design models (e.g. job characteristics model by Hackman & Oldham, 1975, in Ostroff et al., 2003) and is conceptually related to location autonomy. Although the results of the present study underline the importance of certain environmental properties, they also indicate the importance of a supporting social environment (helpful social norms and protocols) and of job design and management style that supports flexible working. Further, the present research extends past works on contextual factors (cf. Kupritz, 2000) by identifying a further factor related to the job, which is role conflict. Some individuals with poor privacy fit had certain perceptions about their role that inhibited them from acting on their privacy needs. For example, participants N12 and N17, who had managerial responsibilities, seem to experience role conflict that hindered them from removing themselves from the team. Yet, one manager who had good privacy fit (N14) elaborated on how managers are actually more empowered and

autonomous than other staff to act on their privacy needs. This suggests that managers in the interview group have varying knowledge about how ABW should be performed in their roles. Clear communications from the business on expectations for each role could be helpful to reduce role conflict. In addition, information or training sessions could be supportive in reducing role conflict as previous intervention studies on role conflict have shown (Noe, Hollenbeck, Gerhart, & Wright, 2006; cf. Rahim & Bonoma, 1979). These sessions could target each role and inform how everyone could make the most of working in an ABW environment without compromising on their tasks and personal needs.

Further, the present research extends past works by identifying another factor related to the job: managers being a role model (Theme 4: The Job). The results exemplified the influence of managers on forming a team's culture and social norms in regard to privacy in positive and in negative ways (see N12). By acting as role models and setting precedents for their teams, managers can introduce behaviour change. As participant N20 expressed: "*[M]y boss … led the initiative to say, 'we've all got to sit next to different people', it was quite empowering.*" The impact managers have on their team's culture and team's behaviour is well documented in the occupational literature (e.g. Schaubroeck et al., 2007; Sperber, 2017; Thompson, 2018) but was neglected in previous privacy research. Manager training, which is a staple in large organisations, could address the impact that managers have on forming a culture that is conducive to working in an ABW environment. According to the results of the present study, a culture that supports ABW seems to be one with high autonomy and psychological safety that allows workers to raise their privacy needs without fearing retaliation.

In line with previous research on the social contextual factors were findings that other people's behaviours were difficult to manage at work. Kupritz (2000) referred to previous research that identified helpful social norms and consent on acceptable behaviour as an important contextual factor. The present research identified that some teams appear to have

unclear social rules about how to interact with their own team or other teams in a respectful way. The section on Theme 2: Social Environment exemplified that their own task flow seems to be of primary importance in some of these teams reported on (e.g. N17). There seems to be little reflection on how one's own actions could affect others. For these teams, reinforced protocols seem to be required. Protocols refer to an office etiquette on how to use different types of office spaces correctly to steer behaviours and prevent misunderstandings and conflict (Oseland, 2009). Scholars have suggested that protocols can be a useful tool for fostering helpful social norms (Oseland, 2009). In relation to the present results, protocols could specifically state how to recognise privacy signals (e.g. wearing headphones, or status on Jabber), and how to interact with others when they are using these signals. Additionally, it could be helpful to define scenario-specific protocols, as similar problematic scenarios were mentioned in the interviews. For example, these could address how to communicate sensitive information (e.g. salaries) in the open-plan office (see quote by N17). Additionally, online training programmes (e.g. H&S or compliance training), which are typically in place in large organisations (e.g. Noe et al., 2006), could address some of these scenarios. For example, these programmes could give a discourse on employees' rights to refuse giving out information they feel uncomfortable sharing in the open. Further, they could differentiate and exemplify appropriate and inappropriate behaviour in the open-plan office.

Further, the present research extends past works on privacy regulating mechanisms (e.g. cf. Kupritz, 2000) by identifying barrier to privacy regulating behaviour that is related to the self: an individual's lack of self-awareness (Theme 4: The Self). Previous research identified individual traits and states that relate rather to different levels of privacy desires (cf. Kupritz, 2000). However, these individual factors were not specifically discussed as being related to the use of privacy regulating behaviours (Kupritz, 2000). A lack of self-awareness in recognising a mismatch between participants' own requirements and the ad hoc environmental conditions was particularly apparent in participant N17. He acknowledged that

he does not respond to his own needs, which consequently affected his work negatively. He also pointed out that the physical environment and the communication technology provide opportunities to interact with others, but the environment and the technology have to be managed correctly (which he finds difficult). Training or information sessions that target awareness and behaviour change could be a helpful approach. These sessions would bring the issue to the forefront and would challenge individuals to develop strategies that could help them identify problematic occasions and cope better with them (e.g. Noe et al., 2006).

8.6 Limitations & Future Research

The interviews utilised scenarios where participants were asked to imagine their responses to situations of potentially stressful privacy scenarios at work. Participants' responses may have been limited by the extent of their experiences. Future studies may benefit from being conducted in an experimental setting for participants to experience and appraise particular privacy scenarios, and refer to them in their responses. However, this might pose challenges considering ecological validity. Further, participants sampled for this study varied in their job grades and job types but all stemmed from one organisation in the UK occupying an ABW office. Therefore, findings may not generalise well to worker populations in other countries and ones that occupy different types of offices. Qualitative evidence from this study[20] and from previous studies suggests that privacy desires and regulation behaviour may vary by culture (Altman, 1975). Further, cross-cultural studies could extend the understanding of how privacy desires and regulation behaviour interact with cultural norms (see footnote 20). Furthermore, the results of the present study suggest that a proactive way of working (as in monitoring one's needs and surrounding and changing the environment if required) is conducive to achieving privacy fit in an ABW environment.

[20] For example, one participant (N13) with a Chinese background expressed very different associations with privacy to the rest of the interviewees and her responses were therefore excluded. A full exploration of cultural differences falls beyond the scope of this thesis.

Future studies could explore whether this type of working is as distinct as it appears and whether it requires more cognitive efforts.

8.7 Conclusions

The findings of this study support Kupritz's (2000) argument that both the social and the physical environment at work can support or hinder the achievement of privacy fit. Furthermore, the findings of the present research extend previous results. They identified new environmental and social attributes and new contextual factors, both particular to activity-based working environments, such as attributes of the job (e.g. autonomy and management style), and individual differences in registering privacy fit. The participants in this study occupied the same office but only half had a good privacy fit. The social and job experience of participants with low privacy fit differed greatly from those who had a good privacy fit. These experiences were characterised by little autonomy, a controlling management style undermining flexible working, role conflict, little perceived psychological safety within the team, and unsupportive social norms and a lack of protocols within teams, which caused privacy invasion. The results suggest that an office environment with a varied design and different settings can cater for a range of privacy needs. This gives support to the suggested superiority of ABW environments for regulating social interaction (e.g. Flynn, 2014; Oseland, 2009). However, the results also identified that a supportive physical environment on its own does not guarantee successful privacy regulation. In order to enable occupants to regulate their privacy successfully, the physical environment has to be accompanied by a supportive social environment with helpful social norms and protocols as well as a supportive management style that offers autonomy.

9 Chapter Nine:

General Discussion & Conclusions

9.1 Chapter Introduction & Aims

Workplace privacy research has significant conceptual and methodological limitations, including unclear conceptualisations of privacy at work, incoherent operationalisation of work privacy, and psychometrically weak measures. Further, prior research has resulted in little conclusive evidence on the negative outcomes of poor privacy at work, and even fewer explanations as to why negative outcomes could occur. Yet, unmet privacy needs have been referred to as one of the primary reasons for occupants' discomfort in open-plan offices (e.g. Danielsson & Bodin, 2009; de Croon et al., 2005; Farrenkopf & Roth, 1980; Hedge, 1982). At the same time, open-plan offices are the predominant office type in Europe (Mravec & Stegmeier, 2017) and new forms of open-plan environments, such as ones that employ activity-based working (ABW), are greatly understudied (Engelen et al., 2018). Evidence is conflicting on whether ABW environments have properties that allow workers to regulate their privacy successfully. Similarly, knowledge on contextual factors that help or hinder privacy regulation in new work environments (such as ABW) is limited. Overall, it appears that the work privacy debate has been in limbo for decades, arguing whether cell or open-plan offices are preferable, rather than systematically investigating what work privacy is, what its stress-related consequences are, why stress-related consequences occur in developing solutions, and which workplace factors constitute a privacy-conducive work environment.

The aims of the thesis were therefore to develop a psychometrically valid multidimensional measure of work privacy, to quantitatively evaluate the link between work privacy, coping appraisal, and stress-related consequences, and to understand more about contextual factors in the ABW environment that enable or hinder work privacy.

This final discussion will first provide a summary of the findings for each empirical study in the context of the literature. The chapter will then describe methodological limitations, future directions for research, and practical implications and end with an overall conclusion on the thesis.

9.2 Summary of Findings

Firstly, in Study 1, a new measure of work privacy was developed, the Privacy At Work Inventory (PAW). A review on prior work privacy measures, as presented in Chapter 3, suggests a practical need for a new multidimensional measure of privacy at work due to various limitations of prior measures. To develop a new measure, a conceptual work privacy definition based on Altman's (1975) privacy regulation framework was introduced, desirable characteristics of a work privacy measure were outlined, and a new set of items and instructions for a privacy at work measure were developed based on qualitative survey data collected for this study. In accordance with the conceptual framework, three dimensions of work privacy were identified that related to input and output controls of information at work (Acoustical and Visual Stimulation, Interruptions, and Confidentiality). Unlike any previous work privacy measure and true to Altman's transactional understanding of privacy, the resulting item pool assesses the frequency of privacy fit, constituting the relative match between one's privacy desires and the fulfilment of such.

Secondly, in Study 2.A and 2.B., the multidimensional Privacy At Work Inventory (PAW) was tested on factor structure and psychometric properties by conducting two quantitative studies on UK open-plan office workers. Four dimensions were retained that are in line with Altman's (1975) privacy regulation theory. Two dimensions specify output controls and two dimensions specify input control over information and stimuli. These dimensions are (1) task privacy, (2) conversation privacy, (3) visual and acoustical stimulation, and (4) interruptions. The results from this study suggest that the PAW has good

psychometrical properties and evinces meaningful relations with variables known to be associated. However, it is acknowledged that these results are of a preliminary nature and that more research is required to fully evaluate the utility of the PAW. In its construction, the PAW is superior to previous work privacy measures as it results in a privacy fit score by means of two frequency scales, which is a new and theory-driven approach to measuring privacy.

Thirdly, in Study 3, the relationships between privacy fit, coping appraisal, and stress-related consequences at work (satisfaction, stress, and emotional fatigue) were explored by using the PAW in a cross-sectional study of open-plan office workers in the UK. SEM results suggest that a poor privacy fit predicts an increase in dissatisfaction, stress, and emotional fatigue. This validates the little and methodologically weak previous findings that privacy fit is related to satisfaction (e.g. Sundstrom, 1986), stress (Goodrich, 1986), and emotional fatigue (Laurence et al., 2013). Privacy-related coping appraisal was found to mediate all of these relationships. This suggests that the perception of privacy-related stress and related outcomes largely depends on someone's perceived ability to cope with the privacy-related stressor. This finding extends previous knowledge on why a poor privacy fit could have broad and severe effects on office workers, which opens up options for prevention. To the best of the author's knowledge, this is the first study to approach the investigation of poor privacy fit effects from a transactional stress perspective (cf. Lazarus & Cohen, 1977). With regard to the prevention of privacy-related stress and other outcomes, additional SEM results from Study 3 are of interest. Study 3 moreover explored the relationship between context variables, privacy fit, and coping appraisal respectively. Privacy fit was predicted by two contextual variables: the variety of settings available to work from, and behavioural protocols on how office spaces should be used. Coping appraisal was predicted by two context variables: the variety of work settings and location autonomy that gives control over choosing a work location. They

support the invalidated claims that high environmental variability is conducive to privacy regulation (e.g. Oseland, 2009) and that protocols help to prevent misunderstanding and conflict (Oseland, 2009). Further, they support the scarce evidence that location autonomy supports the achievement of privacy fit (e.g. Robertson et al., 2008). However, the data was collected cross-sectionally, which does not allow any interpretations on cause and effect relationships between variables and is susceptible to various biases (e.g. CMV) that may have inflated some relations (cf. Lindell & Whitney, 2001; Maxwell & Cole, 2007).

Fourthly, in Study 4, the previously explored relationships between privacy fit, coping appraisal, outcomes, and context factors were assessed longitudinally. This study investigated psychological changes in a workforce that moved from a traditional open-plan office to an activity-based working (ABW) environment. The study was designed to examine whether changes in social-environmental context factors, typically found in ABW environments, lead to changes in privacy fit and coping appraisal. Consequential changes in outcomes of privacy fit were assessed as well. Changes were assessed with measurement points in a sample that moved from an open-plan office to an ABW environment. Cross-lagged autoregression analysis confirmed that perceived changes in the quality and variety of settings as well as the adherence of others to protocols positively influenced post-move privacy fit. Changes in coping appraisal post-move were predicted by an increase in perceived environmental and behavioural flexibility (settings and location autonomy). Both changes in privacy fit and appraisal were associated with increases in job and workplace satisfaction and decreases in emotional and mental work fatigue post-move. With its longitudinal design, this study extends past research by demonstrating the changing nature of privacy fit. Further, it validates the outcomes and predictors of privacy fit and coping appraisal. This study also adds to the scarce research on work privacy in ABW environments.

Fifthly, in Study 5, further context variables that are typical of ABW environments and that are associated with supporting or hindering privacy fit were explored in a qualitative study. On the one hand, this was done to extend the findings of Studies 3 and 4. On the other hand, this was done to extend past research, which a) does not specify how social and environmental factors are linked (e.g. Kupritz, 2000) and b) is scarce in terms of findings about privacy fit in ABW environments (cf. Engelen et al., 2018). For this study, workers that occupy the same ABW office but had different privacy experiences (varying privacy fit scores) were interviewed. The results helped in better understanding the role that social contextual factors play in relation to environmental factors. It became evident that both social and environmental context factors are required to enable occupants to achieve privacy fit at work; a supporting environmental design on its own does not appear to be sufficient. Further, it became apparent that certain factors attributable to the job (autonomy, and management style supporting various aspects of flexible working) are necessary to enable the achievement of privacy fit in an ABW environment. These results extend past research as they elicited new contextual factors in the work context that support privacy fit and shed light on the linkage between the different contextual factors.

9.3 Implications for Research

The research conducted in this thesis has implications for work privacy research, including approaches to theory and empirical work, consideration of the wider contextual system at work, and attentiveness towards industry developments. These implications are discussed below.

Critique about some incoherence in Altman's model (1975), which has been raised in this thesis, appears to be supported by the results of the thesis. Altman was criticised for inconsistent use of appraisal in his model. In his model, appraisal does not consistently precede stress reactions resulting from poor privacy fit (e.g. Folkman & Lazarus, 1985).

However, the results of this thesis suggest that privacy-related coping appraisal informs whether poor privacy fit results in stress or not. A meditating effect was found. Other socio-environmental stress research has produced findings that are related. Mohd Mahudin, Cox, and Griffiths (2012) successfully tested a mediation model in which affective reactions to a crowded situation mediated the relationship between an objective measure of density and the experience of stress and exhaustion among commuters. Employing a cognitive appraisal approach to the research of privacy would follow the call of Lazarus and Cohen (1977), who postulate that socio-environmental stress research has long neglected the role of appraisal. Collectively, this suggests that future studies on work privacy research, particularly those that employ a stress angle, should acknowledge the role of cognitive appraisal.

Further, it became apparent that some theoretical principles of Altman's framework (1975) that previous research had neglected can and should be applied to the empirical research. For example, Altman states that privacy desires are dynamic rather than being stable. The fluctuating nature of desires appears to be a critical detail in understanding and researching privacy. This thesis provides evidence that the frequency of desires (and privacy fit) can and should be assessed to gather data that is meaningful and valid. In addition, this thesis presented evidence that the described fit by Altman between privacy desire and actual privacy can also be empirically investigated and measured. Combined, this approach elicits privacy fit data that is of high individual variance, as it is sensitive to individual's frequency of desires for different privacy types and acknowledges the frequency of achievement (or fit) of these different privacy types.

Further, through the findings of this thesis, it became apparent that it is necessary to regard the socio-environmental system at work as a whole rather than focus primarily on environmental conditions as much of the previous work has done. In addition, it became evident that elements of job design and managerial style can be of importance in supporting or

hindering privacy regulation, particularly in new office concepts that rely on high levels of autonomy (such as ABW).

Lastly, it became evident that the focus of much of the previous research has been on outdated office models such as traditional open-plan offices, with only a small proportion investigating newer developments, such as ABW environments. However, the introduction of ABW started as early as the mid-90s (Veldhoen, 1995). Hence, office research has neglected this industry development for quite some time. In order to inform industry decisions better and ultimately support the workforce, it is suggested that future research should be mindful of office trends.

9.4 Methodological Limitations

Five main methodological limitations will be discussed in the following sections. Firstly, the samples in Studies 2–5 were obtained from one office population in London, UK. Although the sample was heterogenic in its make-up (job grades and types) and the field situation appears to be representative as prior evidence was replicated, surveying one population has potential limitations. Firstly, for the quantitative studies 2–4, the use of a small specific sample instead of a broad probability sample of office workers in the UK comes with the risk that the statistical power to detect the hypothesised effects and accurate effect sizes was limited (Ioannidis, 2008). Secondly, the privacy experiences explored in studies 2–5 could have resulted from working within that particular office, with the colleagues they had and the nature of their jobs. The studies provide interesting insights into this specific population but lack generalisability to worker populations of other professions, in other countries, and to ones that occupy different types of offices.

Secondly, some quantitative data in this thesis was used for more than one research purpose (see Figure 1, Chapter 3). Overall, two data sets were collected (at Time 1 before the office move and at Time 2 after the office move). Only the scale elements of Time 1 and Time

2 data were used for the scale testing (Time 1 data in Study 2.A for EFA testing, Time 2 data in Study 2.B for CFA testing). Roughly a quarter of the Time 1 data set and roughly a half of the Time 2 data set (n = 61) were used for longitudinal analysis in Study 4, whereas the complete data set of Time 1 and those participants of Time 2 that had not taken part before in the Time 1 survey (new participants, n = 44) were used for Study 3. Combining and reusing data for more than one research purpose introduces statistical disadvantages (Kirkman & Chen, 2011). The researcher aimed for a strategy of reusing data that reduces possible risks and disadvantages as much as possible. Further, precautions were taken to control for biases of combining data sets in Study 3. Although recommended (Kirkman & Chen, 2011), the original samples collected were too small to be split for the different studies. However, the consistency of findings across quantitative and qualitative studies in the thesis is encouraging.

Thirdly, the data was collected retrospectively. Particularly in the quantitative studies (2, 3, and 4), participants were asked to recall the frequency of privacy needs and of the achievement of those needs, and the extent of coping resources. This procedure poses the risk of recall bias. Participants might have primarily recalled events that resulted in negative affect, as opposed to events that had little impact. Further, the recall of previous privacy experiences may have been influenced by their subsequent experiences and therefore findings should be treated with caution. Moreover, one of the quantitative assessments was cross-sectional with the retrospective measurement of privacy fit, appraisal, context factors, and outcomes. This additionally limits the conclusions that can be drawn. However, the fact that findings about privacy fit appraisal and outcome as well as context factor relationships appear to be congruent with findings in the longitudinal study is promising.

Fourthly, Studies 3 and 4 relied on self-report on coping appraisal, which has been criticised for being problematic for two reasons (e.g. Westen, Muderrisoglu, Fowler, Shelder, & Koren, 1997). Firstly, Westen et al. (1997) point out that unconscious appraisal and coping

processes are inaccessible to conscious self-report. Models of stress and coping (e.g. Lazarus, 1991) theorise that many of the cognitive processes are not conscious. Further, cognitive research documents that much of coping assessment (i.e. skills of affect regulation strategies) is unconscious (cf. Westen et al., 1997). Yet, most studies of stress and coping, including this thesis, rely exclusively on self-report questionnaires (Westen et al., 1997). Secondly, self-reports on stress levels, related subjective outcomes, and stressors cannot warrant any defensive bias (e.g. Westen et al., 1997). For example, when participants defend against the consciousness of emotional distress they report low on subjective stress but show considerable signs of distress (e.g. Shedler, Mayman, & Manis, 1993). However, there seems to be sufficient evidence that the proposed and test model in this thesis is conceptually viable, even though small effect sizes on the mediation effect might be due to the aforementioned critique.

Fifthly, there are limitations to all quantitative analysis procedures, as no account can be made for any spuriousness effects, for example due to differences in personality traits, which may affect the appraisal of internal resources (e.g. internal locus of control, hardiness, optimism, and self-esteem; Nelson & Simmons, 2003). Particularly in regard to the longitudinal analysis, retest effects and their possible inclusion of construct-irrelevant variance when participants are measured repeatedly with the same instrument form a threat to the validity of conclusions. Further, the attrition between Time 1 and Time 2 studies greatly reduced the size of the final sample and the statistical power. Although theory-driven assumptions about predictors and their directional effect on post-move privacy fit were established, the study cannot determine causal relations between variables in a manner similar to the way an experiment with random assignment can. Although cross-lagged models are in line with aspects of causal inference (measuring putative causes prior to the effects and thereby supporting temporal precedence of the cause), no statistical model can determine

causal relations apart from strong theory and solid experimental research design (Selig & Little, 2012). Furthermore, putative causes could not be manipulated independently from other variables in the model. Hence, causal inference should be drawn with great caution. Moreover, due to the employed regression approach it was not possible to model the unique effect of several causes simultaneously, which is a fundamental aspect of causal inference (Selig & Little, 2012). However, the study results may suggest causal explanations of one variable over another. Overall, there seems to be sufficient evidence that the model is conceptually viable. The use of multiple data sets and the interactions found in these studies of the thesis strengthen the author's confidence in the results.

9.5 Avenues of Future Research

It has been noted throughout the thesis that this line of research warrants further investigation. More specific suggestions for the directions that work privacy research could go in will be discussed further in this section.

Firstly, potential research includes further psychometric testing of the PAW inventory, ideally with a large probability sample. This could include the examination of criterion-related validity (e.g. concurrent and predictive validity) and test-retest reliability, as well as further examination of construct validity (e.g. convergent and discriminant validity). Further, cross-population equivalence of the measure should be tested. For example, the measure could be used for privacy fit assessment in a variety of office environments to test whether it is sufficiently sensitive to assess postulated differences in privacy experience (Danielsson, 2010).

Secondly, once more evidence for the measures' psychometrics qualities has been gathered in different samples, this area of research could be extended to understand the relationship between the frequency of privacy desire, individual differences (e.g. arousal levels), and job profiles. Research on predictors of desires for privacy are limited and it is still

debated how much the level of privacy desires is determined by individual differences, particularly when compared to job requirements (cf. Kupritz, 2011, 1998; Oldham, 1988).

Thirdly, as the studies in this thesis relied on retrospective data collection, which has been criticised for its limitations (e.g. various biases), future studies may benefit from being conducted in an experimental setting for participants to appraise privacy scenarios, and refer to them in their responses.

Fourthly, future studies could benefit from taking a cross-cultural perspective as previous studies suggest that privacy desires and regulating behaviour vary by cultural context (Altman, 1975). The five studies presented in this thesis focused on the privacy fit and privacy regulating behaviour of employees in the United Kingdom. Although roughly half of the respondents of the qualitative Study 5 were of non-English origin (other white background, Asian, or mixed), they were interacting in the sociocultural context of the United Kingdom. Further cross-cultural studies could extend the understanding of how privacy desires and regulation behaviour interact with cultural norms.

Fifthly, future studies could explore whether ABW is as distinct from traditional types of working as it appears in this thesis, and whether it requires more cognitive efforts. The results of Study 5 indicated that successful privacy regulation in an activity-based working environment requires occupants to actively schedule their tasks and requirements. Further, it requires ad hoc adjustments of these plans. To do so, occupants need to be mindful and monitor their own and ideally others' needs and requirements, and observe any changes in social surroundings that might require them to adapt. This might require more efforts cognitively than working in a traditional office setting.

9.6 Implications for Practice

In addition to its implications for future research, this thesis may also inform workplace design and change management professionals. These implications and applications are discussed below.

Firstly, it became evident that the impact of poor privacy fit on the workforce should not be underestimated. Its impact can have varied and severe stress-related consequences at work that can jeopardise psychological well-being (e.g. burnout-related effects). Ultimately, this comes with financial implications for businesses. In 2009, it has been estimated that burnout-related costs had cost the UK economy £28 billion (NICE, 2009).

Secondly, the results of the present research indicate that open-plan offices, which are designed to provide work settings for occupants' varying privacy needs (task and conversation confidentiality, limited interruptions, and limited stimulation), are occupied by more satisfied and less exhausted workers. Setting variety was an important resource for workers as both quantitative and qualitative results have shown. Therefore, workplace design must not only focus on bringing people together but also on providing a mixture of spaces that allow for anonymity, solitude, and intimacy.

Thirdly, and most pressingly, qualitative results indicated that the environment on its own has limitations in facilitating privacy fit. Results across this thesis elicited barriers to privacy regulation that were rooted in (1) workers' level of autonomy, (2) unhelpful social norms and a lack of protocols in their teams, and (3) workers' beliefs about obligations related to their role and its resulting role conflicts.

(1) Qualitative data suggests that managers who undermine workers' jobs and location autonomy hinder them from managing their privacy needs in an open-plan environment. Quantitative data suggests that low levels of location autonomy decrease workers' ability to cope with privacy-related stress and vice versa (high

autonomy predicts high coping appraisal). Similarly, qualitative data suggests that managers who role-model flexible working can empower their teams to do the same and act more autonomously on their needs. Managers giving workers full autonomy over where they work and making them aware that there are plenty of spaces they can choose from seems to be an ideal strategy for keeping their team effective. Managers' impact on steering team culture and norms is well researched (e.g. Schaubroeck et al., 2007; Sperber, 2017; Thompson, 2018). In this context, increasing awareness about the particular management requirements in ABW environments in organisations' managers' training could help create team cultures that are conducive to privacy regulation.

(2) Further, it became apparent that unhelpful social norms within their own and in other teams can pose a difficult barrier to successful regulation of privacy. Qualitative data highlighted the variance in teams' cultures. Some teams appeared to have unclear or no rules about how to interact with others respectfully in the open-plan office. This included, for example, respecting signals for privacy, or communicating sensitive content discreetly. A reinforcement of protocols that define desired and non-desired behaviour in the open-plan office could help to address these issues. The quantitative results of the present research indicated that adherence to protocols made it easier for participants to achieve privacy fit. Protocols could address how to recognise privacy signals (e.g. wearing headphones, or instant messenger status), and how to interact with others when they are using these signals, or how to communicate sensitive information (e.g. salaries) in the open-plan office. Additionally, online training programmes similar to H&S or compliance training (Noe et al., 2006) could address protocols and exemplify appropriate and inappropriate behaviour in the open-plan office.

(3) Further, unhelpful personal strategies were identified as a barrier to successful privacy regulation in the open-plan office. This related most prominently to role conflicts. The qualitative data gave insight into some participants' beliefs, and particularly in managerial roles, they were obligated to be always physically accessible to their team and unable to retreat. This suggests that a clear formulation and communication of role expectations in flexible working environments are outstanding and could be of benefit. In addition, information or training sessions could be supportive on reducing role conflict (Noe et al., 2006; cf. Rahim & Bonoma, 1979). These sessions could target each role and inform how everyone could make the most of working in an ABW environment without compromising on their tasks and personal needs.

9.7 Conclusions

This thesis has contributed to work privacy research by providing an in-depth exploration of workers' privacy experiences in open-plan and ABW environments – a research area of previously limited accounts. The findings from the thesis validated former speculations and single findings on the consequences of unmet privacy needs at work, which have been found to include dissatisfaction, stress, and different forms of fatigue. The thesis exemplified that employing a transactional stress appraisal perspective to investigate work privacy is useful for exploring why privacy-related stress and related consequences occur. Specific factors in the work environment context have been identified to set optimal conditions for workers to manage privacy and privacy-related stress; it has been suggested that this should prevent privacy-related stress and related consequences. As for privacy regulating behaviour, the thesis showed that a broader range of contextual factors than previously assumed are important for enabling regulating behaviour; these include elements of the job as well as role conflicts. The belated development of a multidimensional measure of

privacy fit, based on an established and conceptually superior framework of privacy, has done the groundwork for more thorough examinations in the future of desires for privacy, its fit, its outcomes, and its predictors. Overall, findings from the thesis indicate that work privacy is important but also impacted by a variety of factors at work. Therefore, a comprehensive consideration of the work environment should be considered for practice as well as for research.

References

Allison, P.D. (2001). *Missing data*. Thousand Oaks, CA: SAGE.

Altman, I., & Chemers, M. M. (1980). *Culture and environment*. Monterey, CA: Brooks/Cole.

Altman, I. (1975). *The environment and social behavior: Privacy, personal space, territory, crowding.* Monterey, CA: Brooks/Cole.

Altman, I. (1976). Privacy: A conceptual analysis. *Environment and Behavior, 8,* 7–29.

Altman, I. (1977). Privacy regulation: Cultural universal or culturally specific? *Journal of Social Issues, 33*(3), 66-84.

Anshel, M. H., & Delany, J. (2001). Sources of acute stress, cognitive appraisals, and coping strategies of male and female child athletes. *Journal of Sport Behavior*, *24*, 329–353.

Appel-Meulenbroek, R., Clippard, M., Pfnür, A. (2018). The effectiveness of physical office environments for employee outcomes: An interdisciplinary perspective of research efforts. *Journal of Corporate Real Estate, 20*(1), 56–80.

Appel-Meulenbroek, R., Groenen, P., Janssen, I. (2011). An end-user's perspective on activity-based office concepts. *Journal of Corporate Real Estate. 13*(2). 122–135.

Archea, J. (1977). The place of architectural factors in behavioral theories of privacy. *Journal of Social Issues, 33*, 116–137.

Baba V. V., Jamal, M., & Tourigny, L. (1988). Work and mental health: A decade in Canadian research. *Canadian Psychology/Psychologie canadienne, 39*(1-2), 94–107.

Babin, B., & Boles, J. (1996). The effects of perceived co-worker involvement and supervisor support on service provider role stress, performance, and job satisfaction. *Journal of Retailing, 72*(1), 57–75.

Bailey, G. W. S. (1979). *Privacy and the mental*. Amsterdam: Rodopi N.V.

Bakker, A. B., & Demerouti, E. (2007). The job demands resources model: State of the art. *Journal of Managerial Psychology, 22*, 309–328.

Banbury, S., & Berry, D. C. (1997). Habituation and dishabituation to speech and office noise. *Journal of Experimental Psychology: Applied, 3*(3), 181–195.

Banbury, S., & Berry, D.C. (1998). Disruption of office-related tasks by speech and office noise. *British Journal of Psychology, 89*, 499–517.

Barker, R. (1968). *Ecological psychology: Concepts and methods for studying the environment of human behavior*. Stanford, CA: Stanford University Press.

Barrett, P. (2007). Structural equation modelling: Adjudging model fit. *Personality and Individual Differences, 42*(5), 815–24.

Bates, A. P. (1964). Privacy – a useful concept? *Social Forces, 42*(2), 429–434.

Baum, A., Singer, J. E., & Baum, C. S. (1981). Stress and the environment. *Journal of Social Issues, 37*, 4–35.

BCO. (2014). *BCO guide to specification 2014*. London: British Council for Offices.

Beardsley, E. L. (1971). Privacy: Autonomy and selective disclosure. In J. R. Pennock, & J. W. Chapman, Eds., *Privacy*. New York, NY: Atherton Press.

Beehr, T. A. (1998). Research on occupational stress: An unfinished enterprise. *Personnel Psychology, 51*(4), 835–44.

Bell, P. A., Fisher, J. D., Baum, A., & Greene, T. E. (1990). *Environmental psychology* (3rd ed.) New York: Holt, Rinehart & Winston.

Bellingar, T. A., Kupritz, V. W., & Haworth, Inc., (2006). Privacy matters. *Haworth research paper.*

Bengtsson, H. (2003). Children's cognitive appraisal of others' distressful and positive experiences. *International Journal of Behavioral Development, 27*(5), 457–466.

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin, 107*(2), 238–46.

Blok, M., Groenesteijn, L., Schelvis, R., & Vink, P. (2012). New ways of working: Does flexibility in time and location of work change work behavior and affect business outcomes? *Work, 41*(1), 2605–2610.

Boje, A. (1971). Open-plan offices. *Random House Business*. London, UK: Business Books.

Bollen, K. A. (1989). *Structural equation with latent variables*. Hoboken, NJ: Wiley.

Bollen, K. A., & Curran, P. J. (2006). *Latent curve models: A structural equation perspective.* Hoboken, NJ: Wiley.

Bond, T. G., & Fox, C. M. (2001). *Applying the Rasch model: Fundamental measurement in the human sciences.* (2nd ed.) Mahwah, NJ: Erlbaum.

Boomsma, A., & Hoogland, J. J. (2001). The robustness of LISREL modeling revisited. In R. Cudeck, S. Du Toit, & D. Sörbom (Eds.), *Structural equation models: Present and future. A festschrift in honor of Karl Jöreskog* (pp. 139–168). Chicago: Scientific Software International.

Borsboom, D., Mellenbergh, G. J., & van Heerden, J. (2004). The concept of validity. *Psychological Review, 111*, 1061–1071.

BOSTI - Buffalo Organization for Social and Technological Innovation (1981). *The impact of office environment on productivity and quality of working life: comprehensive findings*. Buffalo, NY: BOSTI.

Boyatzis, R. (1998). *Transforming qualitative information: Thematic analysis and code development.* Thousand Oaks, CA: Sage.

Brand, J. L., & Smith, T. J. (2005). Effects of reducing enclosure on perceptions of occupancy quality, job satisfaction, and job performance in open-plan offices. In *Proceedings of the Human Factors and Ergonomics Society 49th Annual Meeting, 49*, 818–822.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*, 77–101.

Brennan, S. A., Chugh, J. S., & Kline, T. (2002). Traditional versus open office design. *Environment and Behavior, 34*(3), 279–299.

Brill, M., Keable, E., & Fabiniak, J. (2000). The myth of open plan. *Facilities Design and Management, 19*(2), 36–9.

Brill, M., Margulis, S. T., Konar, E., & BOSTI. (1984). *Using office design to increase productivity*. Buffalo, NY: Workplace Design and Productivity.

Brunia, S., de Been, I., & van der Voordt, T. J. M. (2016). Accommodating new ways of working: Lessons from best practices and worst cases. *Journal of Corporate Real Estate, 18*(1), 30–47.

Burgoon, J. K. (1982). Privacy and communication. *Annals of the International Communication Association, 6*(1), 206–249.

Buss, D. M., & Scheier, M. F. (1976). Self-Consciousness, self-awareness, and self-attribution. *Journal of Research in Personality, 10*, 463–468.

Campbell, J. M. (1983). Ambient stressors. *Environment and Behaviour, 15*(3), 355–380.

Candido, C., Kim, J., de Dear, R., & Thomas, L. (2016). BOSSA: a multidimensional post-occupancy evaluation tool. *Building Research and Information, 44*(2), 214–228.

Candido, C., Zhang, F., Kim, J., De Dear, R., Thomas, L., Stapasson, P., & Joko, C. (2016). *Impact of workspace layout on occupant satisfaction, perceived health and productivity.* Ninth Windsor Conference 2016: Making Comfort Relevant, Windsor Great Park, UK.

Caplan, R. D. (1983). Person-environment fit: Past, present, and future. In C. L. Cooper (Ed.), *Stress research* (pp. 35–78). Hoboken, NJ: Wiley.

Caplan, R. D. (1987a). Person-environment fit in organizations: Theories, facts, and values. In A. W. Riley, & S. J. Zaccaro (Eds.), *Occupational stress and organizational effectiveness* (pp. 103–140.). New York: Praeger.

Caplan, R. D. (1987b). Person-environment fit theory and organizations: Commensurate dimensions, time perspectives, and mechanisms. *Journal of Vocational Behavior, 31*, 248–267.

Caplan, R. D., & Harrison, R. V. (1993). Person-environment fit theory: Some history, recent developments, and future directions. *Journal of Social Issues, 49*, 253–275.

Carver, C. S., & Conner-Smith, J. (2010). Personality and coping. *Annual Review of Psychology, 61*, 679–704.

Cattell, R. B. (1978). *The scientific use of factor analysis in behavioral and life sciences*. Boston: Springer.

Cavanaugh, W. J., Farrell, W. R., & Hirtle, P. W. (1962). Speech privacy in buildings. *Journal of the Acoustical Society of America, 34*, 475–492.

Chapin, F. S. (1951). Some housing factors related to mental hygiene. *Journal of Social Issues*, *7*, 164–171.

Churchill, G. A. (1979). A paradigm for developing better measures of marketing constructs. *Journal of Marketing Research, 16*(1), 538–562

Clark, L. A., & Watson, D. (1995). Constructing validity: Basic issues in objective scale development. *Psychological Assessment, 7*(3), 309–319.

Cohen, S. (1978). Environmental load and the allocation of attention. In A. Baum & S. Valins (Eds.), *Advances in environmental psychology*. Hillsdale, N.J.: Lawrence Erlbaum Associates.

Cohen, S. (1980). Aftereffects of stress on human-performance and social-behavior – a review of research and theory. *Psychological Bulletin, 88*(1), 82–108.

Cohen, S., & Spacapan, S. (1984). The social psychology of noise. In D. M. Jones & A. J. Chapman (Eds.), *Noise and society* (pp. 221–245). Chichester, UK: Wiley.

Cole, D. A., Ciesla, J. A., & Steiger, J. H. (2007). The insidious effects of failing to include design-driven correlated residuals in latent variable covariance structure analysis. *Psychological Methods, 12*, 381–398.

Crabtree, B., & Miller, W. (1999). A template approach to text analysis: Developing and using codebooks. In B. Crabtree & W. Miller (Eds.), *Doing qualitative research* (pp. 163–177.) Newbury Park, CA: Sage.

Crouch, A., & Nimran, U. (1989). Perceived facilitators and inhibitors of work performance in an office environment. *Environment and Behavior, 21*(2), 206–226.

Cummins, R. A., & Gullone, E. (2000). *Why we should not use 5-point Likert scales: The case for subjective quality of life measurement*. Second International Conference on Quality of Life in Cities, Singapore.

Çoklu, Ö. & Kayri, M. (2011). The effects of methods of imputation for missing values on the validity and reliability of scales. *Educational Sciences: Theory & Practice, 11*(1), 303–309.

Comrey, A. L., & Lee, H. B. (1992). *A first course in factor analysis* (2nd ed.). Abingdon: Routledge.

Crocker, P. R. E., Kowalski, K. C., & Graham, T. R. (1998). Measurement of coping strategies in sport. In J. L. Duda (Ed.), *Advances in sport and exercise psychology measurement* (pp. 149–164). Morgantown, WV: Fitness Information Technology.

Daly, J., Kellehear, A., & Gliksman, M. (1997). *The public health researcher: A methodological approach.* Melbourne, Australia: Oxford University Press.

Danielsson, C. B. (2010). *The office - an explorative study: architectural design's impact on health, job satisfaction & well-being*. Doctoral thesis, comprehensive summary. Stockholm: The Royal Institute of Technology.

Danielsson, C. B., & Bodin, L. (2008). Office type in relation to health, well-being, and job satisfaction among employees. *Environment and Behavior, 40*(5), 636–668.

Danielsson, C. B., & Bodin, L. (2009). Difference in satisfaction with office environment among employees in different office types. *Journal of Architectural and Planning Research, 26*(3), 241–257.

Davis, G. (1990). *European research on olfactory context as a mediating influence*. Presentation at Virginia Polytechnic Institute and State University, College of Architecture.

De Been, I., & Beijer, M. (2014). The influence of office type on satisfaction and perceived productivity support. *Journal of Facilities Management, 12*(2), 142–157.

De Been, I., Beijer, M., & den Hollander, D. (2015). *How to cope with dilemmas in activity based work environments: Results from user-centred research*. Fourteenth EuroFM Research Symposium, Glasgow, UK.

De Croon, E. M., Sluiter, J. K., Kuijer, P. P. F. M., & Frings-Dresen, M. H. W. (2005). The effect of office concepts on worker health and performance: A systematic review of the literature. *Ergonomics, 48*(2), 119–134.

Demerouti, E., Bakker, A. B., Vardakou, I., & Kantas, A. (2003). The convergent validity of two burnout instruments: A multitrait-multimethod analysis. *European Journal of Psychological Assessment, 19*, 12–23.

DeVellis, R. F. (1991). *Scale development: Theory and applications*. Newbury Park, CA: SAGE.

Dewe, P. (2003). A closer examination of the patterns when coping with work-related stress: Implications for measurement. *Journal of Occupational and Organizational Psychology*, *76,* 517–524.

Dewe, P. (1991). Primary appraisal, secondary appraisal and coping: their role in stressful work encounter. *Journal of Occupational Psychology, 64*, 331-351.

Dewe, P., & Guest, D. (1990). Methods of coping with stress at work: A conceptual analysis and empirical study of measurement issues. *Journal of Organisational Behaviour, 11*, 135–150.

Diamantopoulos, A., & Siguaw, J.A. (2000). *Introducing LISREL*. London: SAGE.

Dillon, W. R., Kumar, A., & Mulani, N. (1987). Offending estimates in covariance structure analysis: Comments on the causes of and solutions to Heywood cases. *Psychological Bulletin, 101*(1), 126–135.

Duffy, F. (1992). *The changing workplace*. London: Phaidon.

Duvall-Early, K., & Benedict, J. O. (1992). The relationships between privacy and different components of job satisfaction. *Environment and Behavior, 24*, 670–679.

Diamantopoulos, A., & Winklhofer, H. M. (2001). Index construction with formative indicators: an alternative to scale development. *Journal of Marketing Research, 38*(2), 269–277.

Dillon, R., & Vischer, J. C. (1987). *Derivation of the tenant questionnaire survey assessment method: Office building occupant survey data analysis* (AES/SAG 1-4:87-9). Ottawa, Ontario, Canada: Architectural and Engineering Services, Public Works Canada.

Edwards, J. R. (2008). Person-environment fit in organizations: An assessment of theoretical progress. *The Academy of Management Annals, 2*, 167-230.

Edwards, J. R., Caplan, R. D., & Harrison, R. V. (1998). Person-environment fit theory: Conceptual foundations, empirical evidence, and directions for future research. In C. L. Cooper (Ed.), *Theories of organizational stress* (pp. 28–67). Oxford: Oxford University Press.

Edwards, J. R., & Cooper, C. L. (1990). The person-environment fit approach to stress: Recurring problems and some suggested solutions. *Journal of Organizational Behavior, 11*(4), 293–307.

Edwards, J. R., & Van Harrison, R. (1993). Job demands and worker health: Three-dimensional re-examination of the relationship between person-environment fit and strain. *Journal of Applied Psychology, 78*(4), 628–648.

Edwards, J. R., & Shipp, A. J. (2007). The relationship between person- environment fit and outcomes: An integrative theoretical framework. In C. Ostroff, & T. A. Judge (Eds.), *The organizational frontiers series. Perspectives on organizational fit* (pp. 209–258). Mahwah, NJ, US: Lawrence Erlbaum Associates.

Edwards, J. A., Webster, S., Van Laar, D., & Easton, S. (2008). Psychometric analysis of the UK Health and Safety Executive's Management Standards work-related stress Indicator Tool. *Work & Stress, 22*(2), 96–107.

Elovainio, M., Heponiemi, T., Kuusio, H., Sinervo, T., Hintsa, T., & Aalto, A. M. (2015). Stressful work environment and wellbeing: What comes first? *Journal of Occupational Health Psychology, 20*(3), 289–300.

Engelen, L., Chau, J., Young, S., Mackey, M., Jeyapalan, D., & Bauman, A. (2018): Is activity-based working impacting health, work performance and perceptions? A systematic review. *Building Research & Information*, 1–12.

Evans, G. W. (1979). Behavioral and physiological consequences of crowding in humans. *Journal of Applied Social Psychology, 9*(1), 27–46.

Evans, G. W., & Stecker, R. (2004). Motivational consequences of environmental stress. *Journal of Environmental Psychology, 24,* 143–165.

Farrenkopf, T., & Roth V. (1980). The university faculty office as an environment. *Environment and Behavior, 12*(4), 467–477.

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*, 175–191.

Fereday, J., & Muir-Cochrane, E. (2006). Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International Journal of Qualitative Methods, 5*(1), 80–92.

Fischer, C. T. (1971). Toward the structure of privacy: Implications for psychological assessment. In A. Giorgi, W. G. Fischer, & R. Von Eckartsberg, Eds., *Duquesne Studies in Phenomenological Psychology*. Pittsburgh, PA: Duquesne University Press.

Field, A. (2005). *Discovering statistics using SPSS* (2nd ed.). London: SAGE.

Flynn, D. (2014). The privacy crisis. *360 Magazine, 68*, 13–35.

Frankenhauser, M., & Gardell, B. (1976). Underload and overload in working life: outline of a multidisciplinary approach. *Journal of Human Stress, 2*, 15–23.

French, J. R. P., Jr., Caplan, R. D., & Harrison, R. V. (1982). *The mechanisms of job stress and strain*. Chichester, UK: Wiley.

French, J. R. P., Jr., Rodgers, W. L., & Cobb, S. (1974). Adjustment as person-environment fit. In G. Coelho, D. Hamburg & J. Adams (Eds.), *Coping and adaptation* (pp. 316–333). New York: Basic Books.

Frone, M. R., & Tidwell, M.-C. O. (2015). The meaning and measurement of work fatigue: Development and evaluation of the Three-Dimensional Work Fatigue Inventory (3D-WFI). *Journal of Occupational Health Psychology, 20*(3), 273–288.

Folkman, S., Lazarus, R. S., Gruen, R., & DeLongis, A. (1986). Appraisal, coping, health status and psychological symptoms. *Journal of Personality and Social Psychology, 50*, 572–579.

Folkman, S. (1984). Personal control and stress and coping processes: A theoretical analysis. *Journal of Personality and Social Psychology, 46*(4), 839–852.

Folkman S, & Lazarus, R. S. (1985). If it changes it must be a process: Study of emotion and coping during three stages of a college examination. *Journal of Personality and Social Psychology, 48*(1), 150–170.

Furnham, A., & Schaeffer, R. (1984). Person-environment fit, job satisfaction and mental health. *Journal of Occupational Psychology, 57*, 295–307.

Gavison, R. (1984). Privacy and the limits of law. In *Philosophical Dimensions of Privacy: An Anthology*. Cambridge: Cambridge University Press. (Reprinted from *Yale Law Journal*, *89*, 421–471).

Geen, R. G., & Gange, J. J. (1977). Drive theory of social facilitation: Twelve years of theory and research. *Psychological Bulletin, 84*(12), 1267–1288.

Ghiselli, E. E., Campbell, J. P., & Zedeck, S. (1981). *Measurement theory for the behavioral sciences*. San Francisco, CA: Freeman and Company.

Goodrich, R. (1982). Seven office evaluations: A review. *Environment and Behavior*, *14*(3), 353–378.

Goodrich, R. (1978). Office environment POE: A dialog with R. Goodrich. *Man-Environment Systems, 8*, 175–190.

Gorgievski, M. J., van der Voordt, T. J. M., van Herpen, S. G. A., & van Akkeren, S. (2010). After the fire: New ways of working in an academic setting. *Facilities, 28*(3/4), 206–224.

Graham, J. W. (2009). Missing data analysis: Making it work in the real world. *Annual Review of Psychology, 60*(1), 549–576.

Greenawalt, K. (1971). The right to privacy. In N. Dorsen (Ed.), *The rights of Americans: What they are-what they should be.* New York: Pantheon.

Guadagnoli, E., & Velicer, W. F. (1988). Relation of sample size to the stability of component patterns. *Psychological Bulletin, 103*, 265–275.

Haans, A., Kaiser, F. G., & de Kort, Y. A. W. (2007). Privacy needs in office environments: Development of two behavior-based scales. *European Psychologist, 12*(2), 93–102.

Harrison, R. V. (1978). Person-environment fit and job stress. In C. L. Cooper & R. Payne (Eds.), *Stress at work* (pp. 175–205). Hoboken, NJ: Wiley.

Harrison, R. V. (1985). The person-environment fit model and the study of job stress. In T. A. Beehr & R. S. Bhagat (Eds.), *Human stress and cognition in organizations* (pp. 23–55). Hoboken, NJ: Wiley.

Harter, J. K., Schmidt, F. L., & Hayes, T. L. (2002). Business-unit-level relationship between employee satisfaction, employee engagement, and business outcomes: A meta-analysis. *Journal of Applied Psychology, 87*(2), 268–279.

Harvey, R. J., Billings, R. S., & Nilan, K. J. (1985). Confirmatory factor analysis of the Job Diagnostic Survey: Good news and bad news. *Journal of Applied Psychology, 70*(3), 461–468.

Haworth, Inc. (2016). 6 steps to Master Change. Retrieved from http://blog.haworth.com/content/spark/en/articles/2018/6-step-to-master-change.html.

Haynes, B. P. (2007). The impact of the behavioural environment on office productivity. *Journal of Facilities Management*, *5*(3), 158–71.

Hedge, A. (1982). The open-plan office: A systematic investigation of employee reactions to their work environment. *Environment and Behavior, 14*(5), 519–542.

Herbert, R. K. (1980). Noise control in the open plan. *Administrative Management, 41*, 27–29.

Hinkin, T. R. (1995). A review of scale development practices in the study of organizations. *Journal of Management, 21,* 967–988.

Hinkin, T. R. (1998). A brief tutorial on the development of measures for use in survey questionnaires. *Organizational Research Methods, 1*, 104–121.

Hinkin, T. R., & Schriesheim, C. A. (1989). Development and application of new scales to measure the French and Raven (1959) bases of social power. *Journal of Applied Psychology, 74*(4), 561−567.

Hobfoll, S. E. (1989). Conservation of resources. A new attempt at conceptualizing stress. *American Psychologist, 44*, 513–524.

Hoendervanger, J. G., de Been, I., van Yperen, N. W., Mobach, M. P., & Albers, C. J. (2016). Flexibility in use: Switching behaviour and satisfaction in activity-based work environments. *Journal of Corporate Real Estate, 18*(1), 48–62.

Hongisto, V. (2008). *Effects of sound masking on workers – a case study in a landscape office*. Ninth Congress of the International Commission on the Biological Effects of Noise, Connecticut, USA.

Hoogland, J. J., & Boomsma, A. (1998). Robustness studies in covariance structure modeling: An overview and a meta-analysis. *Sociological Methods & Research, 26*, 329–367.

Hooper, D., Coughlan, J., & Mullen, M. (2008). Structural equation modelling: Guidelines for determining model fit. *Electronic Journal of Business Research Methods, 6*(1), 53–60.

Hosany, S., & Gilbert, D. (2010). Measuring tourists' emotional experiences toward hedonic holiday destinations. *Journal of Travel Research, 49*(4) 513–526.

Hoyle, R. H. (1999). *Statistical strategies for small sample research*. Thousand Oaks, CA: SAGE.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modelling, 6*(1), 1–55.

Hulin, C. L., & Judge, T. A. (2003). Job attitudes. In W. C. Borman, D. R. Ligen, & R. J. Klimoski (Eds.), *Handbook of psychology: Industrial and organizational psychology* (pp. 255–276). Hoboken, NJ: Wiley.

Hussong, A. M., Curran, P. J., & Bauer, D. J. (2013). Integrative data analysis in clinical psychology research. *Annual Review of Clinical Psychology, 9*, 61–89.

Hutcheson, G. D., & Sofroniou, N. (1999). *The multivariate social science scientist: Statistics using generalized linear models*. Thousand Oaks, CA: SAGE.

Ittelson, W. H., Proshansky, H. M., & Rivlin, L. G. (1970). Bedroom size and social interaction of the psychiatric ward. *Environment and Behavior,* 2, 255–270.

Ioannidis, J. P. A. (2008). Why most discovered true associations are inflated. *Epidemiology, 19*, 640–648.

Janis, I. (1968). Stages in the decision-making process. In R. Abelson & E. Aronson (Eds.), *Theories of cognitive consistency: A sourcebook* (pp. 577–588). Chicago, IL: Rand McNally.

Jamal, M. J., & Baba, V. V. (2000). Job stress and burnout among Canadian managers and nurses: An empirical examination. *Revue Canadienne De Santé Publique, 91*(6), 454–458.

Jiang, B, Liebl, A., Leistner, P., & Yang, J. (2012). Sound masking performance of time-reversed masker processed from the target speech. *Acta Acustica united with Acustica, 98*, 135–141.

Justa, F. C., & Golan, M. B. (1977). Office design: Is privacy still a problem? *Journal of Architectural Research 6*(2), 5–12.

Johnson, C. A. (1974). Privacy as personal control. In D. H. Carson (Series Ed.) & S. T. Margulis (Vol. Ed.), *Man-environment interactions: Evaluations and applications: Part 2*, *Vol. 6. Privacy* (pp. 83–100).Washington, DC: Environmental Design Research Association.

Johnson, V. W. (1991). *Architectural correlates of privacy: the dynamics of privacy regulation*. Ph.D. Thesis, Virginia Polytechnic and State University, 1990. Copyrighted through Michigan: UMI.

Johnson, J. E., & Levanthal, H. (1974). Effects of accurate expectations and behavioral instructions on reactions during a noxious medical examination. *Journal of Personality and Social Psychology, 29,* 710–718.

Jourard, S. M. (1966). Some psychological aspects of privacy. *Law and Contemporary Problems, 31*, 307–318.

Kahneman, D. (1973). *Attention and effort*. Englewood Cliffs, NJ: Prentice-Hall.

Kang, H. (2013). The prevention and handling of the missing data. *Korean Journal of Anesthesiol, 64*(5), 402–406.

Kanter R. M. (1993). *Men and Women of the Corporation*. New York: Basic Books Rev.

Karasek, R., Brisson, C., Kawakami, N., Houtman, I., Bongers, P., & Amick, B. (1998). The Job Content Questionnaire (JCQ): An instrument for internationally comparative assessments of psychosocial job characteristics. *Journal of Occupational Health Psychology, 3*(4), 322–355.

Kearney, M. W. (2017). Cross lagged Panel analysis. In M. R. Allen (Ed.), *The SAGE encyclopedia of communication research methods*. Thousand Oaks, CA: SAGE.

Keeling, T., Clements-Croome, D., & Roesch, E. (2015). The effect of agile workspace and remote working on experiences of privacy, crowding and satisfaction. *Buildings, 5*(3), 880–898.

Kelvin, P. (1973). A socio-psychological examination of privacy. *British Journal of Social and Clinical Psychology, 12*, 248-296.

Kim, J., Candido, C., Thomas, L., & de Dear, R. (2016). Desk ownership in the workplace: The effect of non-territorial working on employee workplace satisfaction, perceived productivity and health. *Building and Environment, 103*, 203–214.

Kim, J., & de Dear, R. (2013). Workspace satisfaction: The privacy–communication trade-off in open-plan offices. *Journal of Environmental Psychology, 36*, 18–26.

Kirkman, B. L., & Chen, G. (2011). Maximizing your data or data slicing? Recommendations for managing multiple submissions from the same dataset. *Management & Organization Review*, *7*(3), 433–446.

Kline, P. (1999). The handbook of psychological testing (2nd ed.). London: Routledge.

Kline, R. B. (2005). *Principles and practice of structural equation modeling* (2nd ed.). New York: The Guilford Press.

Klitzman, S., & Stellman, J. (1989). The impact of the physical environment on the psychological well-being of office workers. *Social Science & Medicine, 29*(6), 733–742.

Kupritz, V. W. (1998). Privacy in the workplace: The impact of building design. *Journal of Environmental Psychology*, *18*(4), 341–356.

Kupritz, V.W. (2000). Privacy management at work: A conceptual model. *Journal of Architectural ad Planning Research, 17*(1), 47–63.

Kupritz, V.W. (2003). Accommodating privacy to facilitate new ways of working. *Journal of Architectural and Planning Research, 20*(2), 122–135.

Kupritz, V.W. (2011). Individual and group privacy needs across job types. Phase 1 Study. *Journal of Architectural and Planning Research, 28*, 298–313.

Kupritz, V.W., & Haworth, Inc., (2005). Ethnographic assessment of individual and group privacy needs: Phase I and II studies. *Haworth research paper*.

Konkol, J., Schanné, F., Lange, S., Weichbrodt, J., Degenhardt, B., Schulze, H., Kleibrink, M., Coradi, A., Schweingruber, D., Metzger-Pegau, L., Neck, R., Gisin, L., Wieser, A., & Windlinger, L. (2017). *Gesundheitsförderliche Büroräume und Workplace Change Management – ein Leitfaden. Handlungsempfehlungen für Unternehmen in der Schweiz, um bei der Planung, Implementierung und Bewirtschaftung von Büroräumen die psychische Gesundheit der Mitarbeitenden zu fördern*. Gesundheitsförderung Schweiz, Bern und Lausanne. Retrieved from: https://gesundheitsfoerderung.ch/assets/public/documents/de/3-bgm/projekte/offices-change-health/Leitfaden_Gesundheitsfoerderliche_Bueroraeume_und_Workplace_Change_Management.pdf

Konkol, J., & Kämpf-Dern, A. (2017). *Performance-oriented office environments in Germany – Concept testing in a real life change project*. ERES Conference 2017, Delft, Netherlands.

Lazarus, R. S. (1966). *Psychological stress and the coping process.* New York: McGraw-Hill.

Lazarus, R. S. (1991). *Emotion and adaptation.* London: Oxford University Press.

Lazarus, R. S. (1993). Coping theory and research: past, present, and future. *Psychosomatic Medicine, 55*(3), 234–247.

Lazarus, R. S. (2006). *Stress and emotion: A new synthesis*. New York: Springer.

Lazarus, R. S., & Cohen, J. B. (1977). Environmental stress. In I. Altman & J. F. Wohlwill, (Eds.), *Human behavior* and the *environment*: *Current theory and research* (pp. 89–127). New York: Plenum.

Lazarus, R. S., & Launier, R. (1978). Stress-related transactions between person and environment. In L. A. Pervin & M. Lewis (Eds.), *Perspectives in interactional psychology* (pp. 287–327). New York: Plenum.

Langer, E. J., & Saegert, S. (1977). Crowding and cognitive control. *Journal of Personality and Social Psychology, 35*, 175–182.

Laurence, G. A., Fried, Y., & Slowik, L. H. (2013). "My space": A moderated mediation model of the effect of architectural and experienced privacy and workspace personalization on emotional exhaustion at work. *Journal of Environmental Psychology, 36*, 144–152.

Lawshe, C. H. (1975). A quantitative approach to content validity. *Personnel Psychology, 28*, 563–575.

Leach, D. J., Wall, T. D., & Jackson P. R. (2003). The effect of empowerment on job knowledge: an empirical test involving operators of complex technology. *Journal of Occupational and Organizational Psychology, 76*, 27–52.

Lee, S. Y., & Brand, J. L. (2005). Effects of control over office workspace on perceptions of the work environment and work outcomes. *Journal of Environmental Psychology, 25*, 323–333.

Leesman. (2017). *The rise and rise of activity based working: Reshaping the physical, virtual and behavioural workspace*. Retrieved from http://www.leesmanindex.com/The_Rise_and_Rise_of_Activity_Based_Working_Research_book.pdf.

Leroy, S. (2009). Why is it so hard to do my work? The challenge of attention residue when switching between work tasks. *Organizational Behavior and Human Decision Processes*, *109,* 168–191.

Le Poire, B. A. Burgoon, J. K., & Parrott, R. (1992). Status and privacy restoring communication in the workplace. *Journal of Applied Communication Research, 20*(4), 419–436.

Ligurgo, V., Philippette, T., Fastrez, P., Collard, A.-S., & Jacques, J. (2018). A method combining deductive and inductive principles to define work-related digital media literacy competences. In S. Kurbanoğlu, J. Boustany, S. Špiranec, E. Grassian, D. Mizrachi, & L. Roy (Eds.), *Information Literacy in the Workplace. Communications in Computer and Information Science* (pp. 245–254). Cham: Springer.

Lin, B. Y. J., Lin, Y. K., Lin, C. C., & Lin, T. T. (2013). Job autonomy, its predispositions and its relation to work outcomes in community health centers in Taiwan. *Health Promotion International*, *28*(2), 166–177.

Lindell, M. K., & Whitney, D. J. (2001). Accounting for common method variance in cross-sectional designs. *Journal of Applied Psychology, 86*, 114–121.

Locke, E. A. (1976). The nature and causes of job satisfaction. In M. D. Dunnette (Ed.), *Handbook of Industrial and Organizational Psychology* (pp. 1297-1349). Chicago, IL: Rand McNally.

Lohr, K. N. (2002). Assessing health status and quality-of-life instruments: Attributes and review criteria. *Qual Life Res, 11*, 193–205.

Lowry, P. B., & Gaskin, J. (2014). Partial least squares (PLS) structural equation modeling (SEM) for building and testing behavioral causal theory: When to choose it and how to use it. *IEEE Transactions on Professional Communication, 57*(2), 123–146.

Lucas, T., Weidner, N., & Janisse, J. (2012). Where does work stress come from? A generalizability analysis of stress in police officers. *Psychology & Health, 27*(12), 1426–1447.

Lütke Lanfer, S. S., Pauls, N., & Göritz, A. S. (2017). *Moving into a new office space: Disentangling the effects of change and office concept on health and well-being.* European Association of Work and Organizational Psychology Conference, Dublin, Ireland.

Maguire, M., & Delahunt, B. (2017). Doing a thematic analysis: A practical, step-by-step guide for learning and teaching scholars. *All Ireland Journal of Teaching and Learning in Higher Education, 8*(3), 3351–33514

Malhotra, N. (1987). Analyzing marketing research data with incomplete information on the dependent variable. *Journal of Marketing Research, 24*(1), 74–84.

Margulis, S. T. (1977). Conceptions of privacy: Current status and next steps. *Journal of Social Issues, 33*, 5–21.

Marsh, H. W., & Hau, K. T. (1999). Confirmatory factor analysis: Strategies for small sample sizes. In R. H. Hoyle (Ed.), *Statistical strategies for small sample size* (pp. 251–306). Thousand Oaks, CA: SAGE.

Marshall, N. J. (1972). Privacy and environment. *Human Ecology, 1*, 93–110.

Maslach, C., & Goldberg, J. (1998). Prevention of burnout: New perspectives. *Applied & Preventive Psychology, 7*(1), 63–74.

Maslach, C., & Jackson, S. E. (1981). The measurement of experienced burnout. *Journal of Occupational Behaviour, 2*, 99–113.

Maxwell, J. A. (2012). *A realist approach to qualitative research*. Thousand Oaks, CA: Sage.

Maxwell, S. E., & Cole, D. A. (2007). Bias in cross-sectional analyses of longitudinal mediation. *Psychological Methods, 12*, 23–44.

McCarrey, M. W., Peterson, L., Edwards, S., & Von Kulmiz, P. (1974). Landscape office attitudes: Reflections of perceived degree of control over transactions with the environment. *Journal of Applied Psychology, 59*, 401–403.

McDonald, R. P., & Ho, M. H. R. (2002). Principles and practice in reporting structural equation analyses. *Psychological Methods, 7*(1), 64–82.

McGrath, J. E. (1970). *Social and psychological factors in stress*. Oxford, England: Holt, Rinehart, & Winston.

McQuitty, S. (2004). Statistical power and structural equation models in business research. *Journal of Business Research, 57*(2), 175–83.

Medik, V. L., & Stettina, C. J. (2014). *Towards responsible workplace innovation: The rise of NWW in public knowledge organizations and their impact on governance*. International Conference on Engineering, Technology and Innovation, Bergamo, Italy.

Mehrabian, A. (1977). A questionnaire measure of individual difference in stimulus screening and associated differences in arousability. *Environmental Psychology and Nonverbal Behaviour, 1, 89*–103.

Milgram, S. (1970). The experience of living in cities. *Science, 167*(3924), 1461–1468.

Mohd Mahudin, N. D., Cox, T., & Griffiths, A. (2012). Measuring rail passenger crowding: Scale development and psychometric properties. *Transportation Research Part F: Traffic Psychology and Behaviour, 15*(1), 38–51.

Morrison, R. L., & Macky, K. A. (2017). The demands and resources arising from shared office spaces. *Applied Ergonomics, 60*, 103–115.

Motowidlo, S. J., Packard, J. S., & Manning, M. R. (1986). Occupational stress: Its causes and consequences for job performance. *Journal of Applied Psychology, 71*(4), 618–629.

Mrvac, S, & Stegmeier, D. (2017). The state of the open office. *FMJ, 27*(1), 20–23.

Mulaik, S. A., James, L. R., Van Alstine, J., Bennett, N., Lind, S., & Stilwell, C. D. (1989). Evaluation of goodness-of-fit indices for structural equation models. *Psychological Bulletin, 105*, 430−445.

Mundfrom, D. J., Shaw, D. G., & Ke, T. L. (2005). Minimum sample size recommendations for conducting factor analyses. *International Journal of Testing, 5*(2), 159–168.

Nasser, F., & Wisenbaker, J. (2003). A monte carlo study investigating the impact of item parceling on measures of fit in confirmatory factor analysis. *Educational and Psychological Measurement*, *63*(5), 729–757.

Nelson, D. L., & Simmons, B. L. (2003). Health psychology and work stress: A more positive approach. In J. C. Quick & L. E. Tetrick (Eds.), *Handbook of occupational health psychology* (pp. 97–119). Washington, DC, US: American Psychological Association.

Newell, P. B. (1995). Perspectives on privacy. *Journal of Environmental Psychology*, *15*(2), 87–104.

Newton, P. E., & Shaw, S. D. (2013). Standards for talking and thinking about validity. *Psychological Methods, 18*, 301–319.

NICE - National Institute for Health and Care Excellence (2009). *PH22: Promoting mental wellbeing at work: full guidance*. London: NICE. Retrieved from http://guidance.nice.org.uk/PH22/Guidance/pdf/English.

Nunnally, J. C. (1967). *Psychometric theory.* New York: McGraw Hill.

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.

Noe, R., Hollenbeck, J., Gerhart, B., & Wright, P. (2006). *Human resources management: Gaining a competitive advantage* (10th ed.). Berkshire, UK: McGraw-Hill.

Ogden, J. (2012). *Health psychology: A textbook* (5th ed.). New York: McGraw-Hill

Oldham, G. R. (1988). Effects of changes in workspace partitions and spatial density on employee reactions: A quasi-experiment. *Journal of Applied Psychology, 73*, 253–258.

O'Neill, M. J. (1994). Work space adjustability, storage, and enclosure as predictors of employee reactions and performance. *Environment and Behavior, 26*(4), 504–526.

O'Neill, M. J., & Carayon, P. (1993). The Relationship between Privacy, Control, and Stress Responses in Office Workers. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 37*(7), 479–483.

Oseland, N. (2009). The impact of psychological needs on office design. *Journal of Corporate Real Estate, 11*(4), 244–254.

Ostroff, C., & Judge, T. A. (2007). *The organizational frontiers series. Perspectives on organizational fit*. Mahwah, NJ, US: Lawrence Erlbaum Associates.

Ostroff, C., Kinicki, A. J., & Tamkins, M. M. (2003). Organizational culture and climate. In W. C. Borman & R. J. Klimoski (Eds.), *Handbook of psychology: Industrial and organizational psychology (*pp. 565–593). Hoboken, NJ: Wiley.

Park, C. L., & Folkman, S. (1997). Meaning in the context of stress and coping. *Review of General Psychology*, *2*, 115–144.

Parrott, W. G., & Hertel, P. T. (1999). Research Methods in Cognition and Emotion. In T. Dalgleish & M. Power (Eds.), *The Handbook of Cognition and Emotion* (pp. 61–81). Chichester, UK: Wiley.

Peacock, E. J., & Wong, P. T. P. (1990). The stress appraisal measure (SAM): A multidimensional approach to cognitive appraisal. *Stress Medicine, 6*(3), 227–236.

Pedersen, D. M. (1979). Dimensions of privacy. *Perceptual and Motor Skills, 48*, 1291–1297.

Pedersen, D. M. (1999). Model for types of privacy by privacy functions. *Journal of Environmental Psychology, 19*(4), 397–405.

Phillips, D. C. (1987). *Philosophy, science, and social inquiry: Contemporary methodological controversies in social science and related applied fields of research*. Oxford, UK: Pergamon Press.

Phillips, A. C., Der, G., & Carroll, D. (2010). Self-reported health, self-reported fitness, and all-cause mortality: Prospective cohort study. *British Journal of Health Psychology, 15*, 337–346.

Ping, R. A. (2004). On assuring valid measures for theoretical models using survey data. *Journal of Business Research, 57*(2), 125–141.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879–903.

Prem, R., Kubicek, B., Diestel, S., & Korunka, C. (2016). Regulatory job stressors and their within-person relationships with ego depletion: The roles of state anxiety, self-control effort, and job autonomy. *Journal of Vocational Behavior, 29*, 22–32.

Preston, C. C., & Colman, A. (2000). Optimal number of response categories in rating scales: Reliability, validity, discriminating power, and respondent preferences. *Acta Psychologica, 104,* 1–15.

Raffaello, M., & Maas, A. (2002). Chronic exposure to noise in industry. *Environment and Behavior, 34*(5), 651–671.

Rahim, A., & Bonoma, T. V. (1979). Managing organizational conflict: A model for diagnosis and intervention. *Psychological Reports, 44*(3), 1323–1344.

Rashid, M., Wineman, J., & Zimring, C. (2009). Space, behavior, and environmental perception in open plan offices: A prospective study. *Environment and Planning B: Planning and Design, 36,* 432–449.

Rashid, M., & Zimring, C. (2008). A review of the empirical literature on the relationships between indoor environment and stress in health care and office settings: Problems and prospects of sharing evidence. *Environment and Behavior, 40*,151–190.

Rick, T., Acton, S., & Payne, R. (1988). Acute and chronic stress in cardiothoracic anaesthetists. *Stress Med, 4*, 3–9.

Robertson, M. M., Huang, Y.-H., O'Neill, M. J., & Schleifer, L. M. (2008). Flexible workspace design and ergonomics training: Impacts on the psychosocial work environment, musculoskeletal health, and work effectiveness among knowledge workers. *Applied Ergonomics, 39*(4), 482–494.

Ruiter, R. A. C., Verplanken, B., Kok, G., & Werrij, M. Q. (2003). The role of coping appraisal in reactions to fear appeals: Do we need threat information. *Journal of Health Psychology, 8*(4), 465–474.

Sameroff, A. J. (1983). Developmental systems: Contexts and evolution. In W. Kessen (Ed.), *Handbook of child psychology: Vol. 1. History, theory, and methods* (pp. 237–294). Hoboken, NJ: Wiley.

Schaubroeck, J., Lam, S. S. K., & Cha, S. E. (2007). Embracing transformational leadership: Team values and the impact of leader behavior on team performance. *Journal of Applied Psychology, 92*(4), 1020–1030.

Schoeman, F. D. (1984). Privacy: philosophical dimensions of the literature. In F. D. Schoeman (Ed.), *Philosophical dimensions of privacy: An anthology*. Cambridge: Cambridge University Press.

Scott, S. B., Graham-Engeland, J. E., Engeland, C. G., Smyth, J. M., Almeida, D. M., Katz, M. J., Lipton, R. B., Mogle, J. A., Munoz, E., Ram, N., & Sliwinski, M. J. (2015). The effects of stress on cognitive aging, physiology and emotion (ESCAPE) project. *BMC Psychiatry, 15*, 146–161.

Seddigh, A., Berntson, E., Bodin Danielson, C., & Westerlund, H. (2014). Concentration requirements modify the effect of office type on indicators of health and performance. *Journal of Environmental Psychology, 38*, 167–174.

Selig, J. P., & Little, T. D. (2012). Autoregressive and cross-lagged panel analysis for longitudinal data. In B. Laursen, T. D. Little, & N. A. Card (Eds.), *Handbook of developmental research methods* (pp. 265–278). New York, NY, US: Guilford Press.

Severens, J. L., Mulder, J., Laheij, R. J. F., & Verbeek, A. L. M. (2000). Precision and accuracy in measuring absence from work as a basis for calculating productivity costs in The Netherlands. *Social Science & Medicine, 51*(2), 243–249.

Shedler, J., Mayman, M., & Manis, M. (1993). The illusion of mental health. *American Psychologist, 48*, 1117-1131.

Shils, E. B. (1966). Privacy: its constitution and vicissitudes. *Law and Contemporary Problems, 31*, 281–305.

Shirom, A. (2011). Job-related burnout: A review of major research foci and challenges. In J. C. Quick & L. E. Tetrick (Eds.), *Handbook of occupational health psychology* (2nd ed., pp. 223–241). Washington, DC: American Psychological Association.

Smith-Jackson, T. L., & Klein, K. W. (2009). Open-plan offices: Task performance and mental workload. *Journal of Environmental Psychology, 29*(2), 279–289.

Solomon, M., Bamossy, G., & Askegaard, S. (1999). *Consumer behaviour: A European perspective*. Englewood Cliffs, NJ: Prentice Hall.

Spector, P. E. (1992). *Summated ratings scales construction*. Newbury Park, CA: SAGE.

Sperber, S. C. (2017). The top managers' impact on opening the organizational culture to innovation. *International Journal of Innovation Management*, *21*(2), 1–42.

Steelcase, Inc., (2018). *Driving Culture Change at Steelcase's HQ*. Retrieved from: https://www.steelcase.com/research/articles/topics/brand-culture/steelcase-inc/

Steele, F. I. (1986). *Making and managing high-quality workplaces*. *An organizational ecology***.** New York: Teachers College Press.

Steiger, J. H. (2007). Understanding the limitations of global fit assessment in structural equation modelling. *Personality and Individual Differences, 42*(5), 893–98.

Stevens, J. P. (2002). *Applied multivariate statistics for the social sciences* (4th ed.). Hillsdale, NJ: Erlbaum.

Stokols, D., & Scharf, T. (1990). Developing standardized tools for assessing employees' ratings of facility performance. In G. Davis & F. Ventre (Eds.), *Performance of buildings and serviceability of facilities, ASTM STP 1029* (pp. 55–79). Philadelphia: American Society for Testing and Materials.

Stull, E. D., Kline Leidy, N., Parasuraman, B., & Chassany, O. (2009). Optimal recall periods for patient-reported outcomes: challenges and potential solutions. *Current Medical Research and Opinion, 25*(4), 929–942.

Sundstrom, E. (1986). Privacy in the office. In J. D. Wineman (Ed.), *Behavioral Issues in Office Design* (pp. 177–203). New York: Van Nostrand.

Sundstrom, E. (1978). Crowding as a sequential process: Review of research on the effects of density on humans. In A. Baum & Y. M. Epstein (Eds.), *Human response to crowding* (pp. 31-116). Hillsdale, NJ: Lawrence Erlbaum.

Sundstrom, E., Burt, R. E., & Kamp, D. (1980). Privacy at work: Architectural correlates of job satisfaction and job performance. *Academy of Management Journal*, *23*, 101-117.

Sundstrom, E., et al. (1994). Office noise, satisfaction, and performance. *Environment and Behavior, 26*(2), 195–222.

Sundstrom, E., Herbert, R. K., & Brown, D. (1982b). Privacy and communication in an open plan office: a case study. *Environment and Behavior, 14*(3), 379–392.

Sundstrom, E., & Sundstrom, M. G. (1986). *Work places: The psychology of physical environment in offices and factories.* Cambridge: Cambridge University Press.

Sundstrom, E., Town, J. P., Brown, D. W., Forman, A., & McGee, C. (1982a). Physical enclosure, type of job, and privacy in the office. *Environment and Behavior, 14*, 543–559.

Szilagyi, A., & Holland, W. (1980). Changes in social density: Relationships with functional interaction and perceptions of job characteristics, role stress, and work satisfaction. *Journal of Applied Psychology, 65*(1), 28–33.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). New York: Allyn and Bacon.

Taris, T. W. (2000). *A Primer in Longitudinal Data Analysis*. London: SAGE.

Taris, T. W. (2008). Reliability issues in longitudinal research. In M. Scott (Ed.), *Handbook of Longitudinal Research: Design, Measurement, and Analysis*. Boulder, Colorado, US: Elsevier.

Thompson, L. L. (2018). *Making the Team: A Guide for Managers* (6th ed.). New York: Pearson Education.

Thompson, E. R., & Phua, F. T. T. (2012). A Brief Index of Affective Job Satisfaction. *Group & Organization Management, 37*(3), 275–307

Thurstone, L. L. (1947). *Multiple factor analysis*. Chicago: University of Chicago Press.

Topf, M., & Dillon, E. (1988). Noise-induced stress as a predictor of burnout in critical care nurses. *Heart & Lung: the Journal of Critical Care, 17*(5), 567–574.

Vander Elst, T., Van den Broeck, A., De Cuyper, N., & De Witte, H. (2014). On the reciprocal relationship between job insecurity and employee well-being: Mediation by perceived control? *Journal of Occupational and Organizational Psychology, 87*(4), 671–693.

Van der Voordt, T. J. M. (2004). Productivity and employee satisfaction in flexible workplaces. *Journal of Corporate Real Estate, 6*(2), 133–148.

Vandenberg, R. J., Park, K. O., DeJoy, D. M., Wilson, M. G., & Griffin-Blake, C. S. (2002). The healthy work organization model: Expanding the view of individual health and well-being in the workplace. In P. L. Perrewe & D. C. Ganster (Eds.), *Historical and current perspectives on stress and health (research in occupational stress and well-being, Volume 2)* (pp. 57–115). Oxford, England: JAI Press / Elsevier Science.

Van Sell, M., Brief, A. P., & Schuler, R. S. (1981). Role conflict and role ambiguity: Integration of the literature and direction for future research. *Human Relations, 34*, 43–7l.

Veldhoen, E. (1995). *The demise of the office*. Rotterdam: Uitgeverij 010.

Veldhoen + Company. (2014). *Workplace trends 2012, activity based working*. Retrieved from https://www.slideshare.net/maggieprocopi/workplace-trends-2012-activity-based-working-in-the-netherlandslouis-lhoest?related=2

Veitch, J. A., Bradley, J. S., Legault, L. M., Norcross, S. G., & Svec, J. M. (2002). *Masking speech in open-plan offices with simulated ventilation noise: Noise level and spectral compositing effects on acoustic satisfaction (IRCAIRA846)*. Ottawa, Canada: NRC Institute for Research in Construction.

Veitch, J. A., Charles, K. E., Farley, K. M. J., & Newsham, G. R. (2007). A model of satisfaction with open-plan office conditions: COPE field findings. *Journal of Environmental Psychology, 27*(3), 177–189.

Vinsel, A., Brown, B. B., Altman, L., & Foss, C. (1980). Privacy regulation, territorial displays, and effectiveness of individual functioning. *Journal of Personality and Social Psychology, 39,* 1104–1115.

Vos, P. G. J. C., & Van der Voordt, D. J. M. (2002). Tomorrow's offices through today's eyes, effects of office innovation in the working environment. *Journal of Corporate Real Estate, 4*, 48–65.

Wallis, C., Steptoe, S., & Cole, W. (2006). Help! I've lost my focus. *Time, 167*(3), 72-79.

Walther, J. B. (1994). Impression development in computer-mediated interaction. *Western Journal of Communication, 57,* 381–398.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*(6), 1063–1070.

Webb, C. M., Collin, S. M., Deave, T., Haig-Ferguson, A., Spatz, A., & Crawley, E. (2011). What stops children with a chronic illness accessing health care: A mixed methods study in children with Chronic Fatigue Syndrome/Myalgic Encephalomyelitis (CFS/ME). *BMC Health Services Research, 11*(308), 1–8.

Webster, N. (1979). Webster's new twentieth century unabridged dictionary. New York: Publishers International.

Weinstein, N. D. (1982). Community noise problems: evidence against adaptation. *Journal of Environmental Psychology, 2*, 87–97.

Westen, D., Muderrisoglu, S., Fowler, C., Shedler, J., & Koren, D. (1997). Affect regulation and affective experience: Individual differences, group differences, and measurement using a Q-sort procedure. *Journal of Consulting and Clinical Psychology, 65*(3), 429–439.

Westin, A. F. (1970). *Privacy and freedom*. New York: Atheneum.

Willett, J. B., Singer, J. D., & Martin, N. C. (1998). The design and analysis of longitudinal studies of development and psychopathology in context: Statistical models and methodological recommendations. *Development and Psychopathology, 10*, 395–426.

Wohlers, C., & Hertel, G. (2017). Choosing where to work at work – Towards a theoretical model of benefits and risks of activity-based flexible offices. *Ergonomics, 60*(4), 467–486.

Wyllie, T., Green, M., Nagrath, R., & Town, A. (2012). *Activity based working*. Retrieved from http://www.jll.com.au/australia/en-au/Documents/jll-au-activity-based-working-2012.pdf

Zagreus, L., Huizenga, C., Arens, E., & Lehrer, D. (2004). Listening to the occupants: A web-based indoor environmental quality survey. *Indoor Air, 14*(8), 65–74.

Zalesny, M., & Farace, R. (1987). Traditional versus open offices: a comparison of sociotechnical, social relations, and symbolic meaning perspectives. *Academy of Management Journal, 30*(2), 240–259.

Zeisel, J. (1984). *Inquiry by design*. Cambridge: Cambridge University Press.

Appendices

Appendix A: Materials used in Study 1

Study 1 Questionnaire

Information Sheet and Consent Form

Employees' Experiences of Regulating Social Interaction at Work

Participant Information Sheet

Introduction
This survey aims to understand employees' experiences of regulating social interaction with co-workers at work. Before you begin, please read the following information carefully.

What is the purpose of the study?
This study seeks to understand employees' experience of a mismatch between their need for different levels of social interaction at work and the amount they actually get.

Why have I been invited to take part in the study?
We are asking employees working in offices to tell us about their experiences.

Do I have to take part?
You are not obliged to take part. Participation is voluntary and you can withdraw at any time without giving a reason.

What is involved if I take part?
In part 1 of this questionnaire you will be asked to think about two situations which you have experienced at work. Once you have a particular instance in mind we would like you to respond to four open-ended and three rating questions about your experience. In part 2 of this questionnaire you will be asked three questions about your general experience at work and in part 3 you will be asked about the nature of your work and your demographic details.

What will I have to do?
You will have to answer a series of questions. Please click the button below to begin.

How long will the survey take?
It will take between 5-10 minutes to complete the survey.

What are the possible disadvantages or risks of taking part?
When answering the questions, you may remember and report some negative experiences. It is not unusual to feel some negative emotions when describing bad experiences; remember that you have no obligation to describe things in detail if that upsets you. If you report any complaints about any areas of your work herein, you should know that we will not be able to follow up any complaints for you.

What are the possible benefits of taking part?
By taking part you will support a PhD research project on the regulation of social interaction at work. We hope this survey will lead to a better understanding of knowledge workers' experience in the office. We might produce an academic publication from this survey and/or present research findings in academic conferences.

What happens when the research study stops?
After survey closure, the data will be analysed and a report will prepared.

Will my taking part in the study be kept confidential?
Yes. All of the information you give will be anonymised. People who read or hear about any survey findings will not know you have participated. Data will be stored securely in accordance with the Data Protection Act 1998.

What if there is a problem?
The PhD project is supervised by Dr Birgitta Gatersleben and Professor David Uzzell. If you have any concerns about this research or feel you have been placed at risk please contact Dr Birgitta Gatersleben at b.gatersleben@surrey.ac.uk or Professor David Uzzell at d.uzzell@surrey.ac.uk.

If you have any further questions regarding the research or are interested in the final results please contact Clara Weber at c.f.weber@surrey.ac.uk.

Thank you for taking the time to read this Information Sheet.

Participant Consent Form

I the undersigned voluntarily agree to take part in the survey:

I have read and understood the Information Sheet provided. I have been given a full explanation by the investigators of the nature, purpose and likely duration of the survey, and of what I will be expected to do. I have been advised about any discomfort and possible ill-effects on my health and well-being which may result. I have been given the opportunity to ask questions on all aspects of the study and have understood the advice and information given as
a result.

I agree to comply with any instruction given to me during the
survey.

I consent to my personal data, as outlined in the accompanying information sheet, being used for this survey and other research. I understand that all personal data relating to volunteers is held and processed in the strictest confidence, and in accordance with the Data Protection Act (1998).

I understand that I am free to withdraw from the survey at any time without needing to justify my decision and without prejudice.

I confirm that I have read and understood the above and freely consent to participating in this study. I have been given adequate time to consider my participation and agree to comply with the instructions and restrictions of the survey. By continuing with the survey and proceeding onto the next screen you are consenting to the study.

- Yes
- No

Scenario - Too much contact

Part 1 - Two Situations at Work

Situation 1

Please take a few moments to think of an occasion at work when you were trying to complete a task but you had **more** contact or interaction with your co-workers than you wanted or needed at that particular moment. The contact may have been work-related or non-work related, and may have been face-to-face or virtual. Please choose a situation that took place in your current job and anytime between now and the beginning of the year (January 4th, 2016).

Please answer as much as you can remember and be as descriptive as possible (avoid giving only one or two word answers). There are no right or wrong answers. Please state below if you can't think of an incident that took place since the beginning or the year.

1. Please describe the situation in detail.

2. Did it affect how you were feeling at that particular moment and if so how?

Please indicate how much it affected how you were feeling on a scale ranging from "1 - Not affected at all" to "7 - Extremely affected".

1-Not affected at all	2-Minimally affected	3-Slightly affected	4-Moderately affected	5-Considerably affected	6-Strongly affected	7-Extremely affected

Please describe how you were feeling at that particular moment?

3. Did it affect what you were doing at that particular moment and if so how?

Please indicate how much it affected what you were doing on a scale ranging from "1 - Not affected at all" to "7 - Extremely affected".

1-Not affected at all	2-Minimally affected	3-Slightly affected	4-Moderately affected	5-Considerably affected	6-Strongly affected	7-Extremely affected

Please describe how it affected what you were doing.

4. If you could have changed one thing in that particular situation what would you have changed?

5. Approximately when did this particular event take place?

- In May
- In April
- In March
- In February
- In January

6. How often, since the beginning of the year, have you encountered similar instances at your workplace?

Please indicate the frequency of occurrence on a scale ranging from "1 - Extremely seldom" to "7 - Extremely often".

1-Extremely seldom	2-Seldom	3-Occasionally	4-Sometimes	5-Regularly	6-Often	7-Extremely often

Scenario - too little contact

Situation 2

Please take a few moments to think of an occasion at work when you were trying to complete a task but you had **less** contact or interaction with your co-workers than you wanted or needed at that particular moment. The contact you were seeking may have been work-related or non-work related, and you may have wanted face-to-face or virtual contact. Please choose a situation that took place in your current job and anytime between now and the beginning of the year (January 4th, 2016).

Please answer as much as you can remember and be as descriptive as possible (avoid giving only one or two word answers). There are no right or wrong answers. Please state below if you can't think of an incident that took place since the beginning or the year.

1. Please describe the situation in detail.

2. Did it affect how you were feeling at that particular moment and if so how?

Please indicate how much it affected how you were feeling on a scale ranging from "1 - Not affected at all" to "7 - Extremely affected".

1-Not affected at all	2-Minimally affected	3-Slightly affected	4-Moderately affected	5-Considerably affected	6-Strongly affected	7-Extremely affected

Please describe how you were feeling at that particular moment.

3. Did it affect what you were doing at that particular moment and if so how?

Please indicate how much it affected what you were doing on a scale ranging from "1 - Not affected at all" to "7 - Extremely affected".

1-Not affected at all	2-Minimally affected	3-Slightly affected	4-Moderately affected	5-Considerably affected	6-Strongly affected	7-Extremely affected

Please describe how it affected what you were doing.

4. If you could have changed one thing in that particular situation what would you have changed?

5. Approximately when did this particular event take place?

- In May
- In April
- In March
- In February
- In January

6. How often, since the beginning of the year, have you encountered similar instances at your workplace?

Please indicate the frequency of occurrence on a scale ranging from "1 - Extremely seldom" to "7 - Extremely often".

1-Extremely seldom	2-Seldom	3-Occasionally	4-Sometimes	5-Regularly	6-Often	7-Extremely often

Part 2 - your experience at work- privacy questions

Part 2 - Your Experience at Work

Please answer the following three questions according to your experience at work since the beginning of the year.

1. Please indicate your agreement with the following statements on a scale ranging from "1 - Strongly disagree" to "7 - Strongly agree".

	Strongly disagree	Mostly disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Mostly agree	Strongly agree
I am able to concentrate fully on my job when I am at work.							
When I am in my office, I can work with few distractions or interruptions.							
Interruptions at work often prevent me from giving my full attention to my job.							
I can talk with my co-workers in confidence while in my office.							
It is difficult to work in my office because I have to worry about disturbing others.							
I am unable to have a personal or private discussion while at work.							

2. How satisfied are you with the sound privacy in your workspace (ability to have conversations without your neighbours overhearing and vice versa)?

Please indicate your satisfaction level on a scale ranging from "1 - Extremely dissatisfied" to "7 - Extremely satisfied".

1-Extremely dissatisfied	2-Moderately dissatisfied	3-Slightly dissatisfied	4-Neither satisfied nor dissatisfied	5-Slightly satisfied	6-Moderately satisfied	7-Extremely satisfied

3. How satisfied are you with the level of visual privacy in your workspace?

Please indicate your satisfaction level on a scale ranging from "1 - Extremely dissatisfied" to "7 - Extremely satisfied".

1-Extremely dissatisfied	2-Moderately dissatisfied	3-Slightly dissatisfied	4-Neither satisfied nor dissatisfied	5-Slightly satisfied	6-Moderately satisfied	7-Extremely satisfied

Demographic information and info about job

Part 3 - Demographic Information

Gender

- Female
- Male

Age (enter years)

Length of employment in the company. Please enter years or months and indicate which one you chose.

Job type

Job role or position

- Junior or graduate position
- Professional
- Senior or managerial position
- Associate, director or partner
- Other

Please estimate *roughly* the percentage of time you have worked at the different locations listed below. Please consider a typical month between now and the beginning of the year.

Working in the office	0
Working from home	0
Working in transit	0
Working at a client's office	0
Other	0
Total	0

Your usual workplace

- Own desk in open plan office (more than 6 occupants)
- Shared desk in open plan office (more than 6 occupants)
- Single person office
- Desk in two person office
- Desk in multi person office (between 3 to 6 occupants)
- Other

How many people do you share the open plan office with? Please give a rough estimate if you are uncertain.

Have your work conditions (e.g. your usual workplace, your team etc.) changed since the beginning of the year?

- Yes
- No

What has changed?

When did it change?

- In May
- In April
- In March
- In February
- In January

final question and end page

If you have any feedback on this survey or more general comments on your experience of regulating social interactions at work, please share them in the text field below.

Thank you for your participation!
For further questions about the research project please contact Clara Weber at c.f.weber@surrey.ac.uk.
If you have any concerns about this research or feel you have been placed at risk please contact Dr Birgitta Gatersleben at b.gatersleben@surrey.ac.uk or Professor David Uzzell at d.uzzell@surrey.ac.uk.

Appendix B: Supplementary Results Study 1

Table B.1

Desired privacy items and instruction dimension 4 – Anonymity (Study 1)

		In the last 4 weeks, I wanted or needed to ...	In the office, I was able to…
		(1) Never – (7) All the time	(1) Never – (7) All the time
1	... work in an environment where I am anonymous		
2	… work where no one recognizes me		
3	... work amongst other people without being accessible to my co-workers		
4	... work where I cannot be observed by my co-workers		

Table B.2

Desired privacy items and instruction dimension 5 - Solitude (Study 1)

		In the last 4 weeks, I wanted or needed to ...	In the office, I was able to…
		(1) Never – (7) All the time	(1) Never – (7) All the time
1	…work where I am all by myself		
2	... work in a secluded area		
3	... work where I do not have to talk to anyone		
4	... work where I do not have to see anyone		
5	... work where I cannot hear anyone		
6	... work where I cannot be observed by anyone		

Appendix C: Supplementary Results Study 2

Table C.1

CVR scores per item (Study 2 – Pilot Study)

Items	Counts			CVR Mean Score
	1 Essential	0 Useful but not essential	-1 Not necessary	
No vis distractions long	8	5	1	0.50
No vis distractions	8	6	0	0.57
No noise distractions long	9	4	1	0.57
Visually calm env	8	6	0	0.57
No noise distractions	10	4	0	0.71
Quiet env	10	4	0	0.71
Min acoustical distractions	8	5	1	0.50
Uninterrupted by queries	12	1	1	0.79
Not asked anything long	9	5	0	0.64
Less accessible	10	2	2	0.57
No social engaging	8	5	1	0.50
Without others seeing	9	5	0	0.64
Where keep work conf	12	2	0	0.86
Not looking over shoulder	7	7	0	0.50
Conf conversations	11	2	1	0.71
Conv without dist others	9	5	0	0.64
Non-conf conversations	9	3	2	0.50

Note. n = 14. Overall CVR mean score = 0.62

Table C.2

Rotated factor loadings on achieved privacy (Study 2.A)

	Factor loadings			
Items	Ac. &Vis. Stimulation	Task Confidentiality	Interruptions	Conv Confidentiality
No noise distractions	**.88**	.46	.56	.43
No vis distractions	**.87**	.47	.52	.45
Visually calm env	**.86**	.45	.55	.48
No noise distractions long	**.86**	.38	.53	.37
No vis distractions long	**.84**	.46	.53	.43
Quiet env	**.83**	.39	.57	.37
Min acoust distractions	**.72**	.46	.54	.52
Without others seeing	.49	**.94**	.45	.63
Not looking over shoulder	.51	**.90**	.47	.62
Where keep work conf	.48	**.87**	.45	.72
Not asked anything long	.57	.39	**.94**	.35
Uninterrupted by queries	.59	.42	**.92**	.37
No social engaging	.58	.42	**.88**	.41
Less accessible	.55	.54	**.78**	.50
Non-conf conversations	.43	.61	.32	**.83**
Conf conversations	.44	.65	.41	**.83**
Conv without dist others	.46	.55	.43	**.83**

Note. n = 195. Listwise deletion. Extraction: Principle axis exploratory factor analysis. Rotation: Oblimin. The final four-factor solution with 17 items has excellent sample adequacy (Kaiser-Meyer-Olkin .91 > .5), inter-item correlations (Bartlett's test of x^2 (136) = 2867.18, p < .001), and adequate total item variance (76% > 60%).

Table C.3

Item means, standard deviations, and zero-order correlations between desired privacy items (Study 2.A)

	Item	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	No vis distractions long	3.81	1.71	-																
2	No vis distractions	3.52	1.74	.80**	-															
3	No noise distractions long	4.20	1.77	.80**	.64**	-														
4	Visually calm env	3.88	1.60	.75**	.74**	.66**	-													
5	No noise distractions	4.05	1.72	.65**	.69**	.71**	.61**	-												
6	Quiet env	4.27	1.50	.63**	.61**	.71**	.69**	.64**	-											
7	Min acoustical distractions	4.32	1.63	.56**	.49**	.54**	.51**	.50**	.49**	-										
8	Uninterrupted by queries	3.99	1.65	.45**	.36**	.50**	.40**	.40**	.48**	.27**	-									
9	Not asked anything long	4.09	1.69	.49**	.42**	.55**	.44**	.46**	.50**	.29**	.82**	-								
10	Less accessible	3.17	1.59	.23**	.19**	.27**	.35**	.22**	.34**	.13	.63**	.56**	-							
11	No social engaging	3.54	1.59	.39**	.37**	.39**	.42**	.32**	.46**	.14	.59**	.66**	.54**	-						
12	Without others seeing	2.92	1.73	.29**	.26**	.21**	.24**	.25**	.16*	.23**	.24**	.25**	.23**	.24**	-					
13	Where keep work conf	2.99	1.77	.30**	.31**	.23**	.25**	.27**	.16*	.23**	.27**	.27**	.20**	.25**	.79**	-				
14	Not looking over shoulder	3.50	1.95	.34**	.31**	.26**	.30**	.27**	.27**	.24**	.29**	.28**	.23**	.23**	.74**	.57**	-			
15	Conf conversations	3.87	1.68	.28**	.29**	.28**	.30**	.28**	.24**	.25**	.29**	.33**	.36**	.28**	.48**	.47**	.49**	-		
16	Conv without dist others	4.65	1.33	.31**	.33**	.38**	.33**	.32**	.30**	.36**	.29**	.31**	.28**	.19**	.27**	.29**	.26**	.47**	-	
17	Non-conf conversations	4.16	1.51	.38**	.32**	.28**	.34**	.27**	.23**	.27**	.19**	.24**	.12	.17*	.43**	.40**	.42**	.54**	.45**	-

Note. $n = 195$. *$p < .05$, **$p < .01$ (2-tailed). Listwise deletion. See Study 1 for item wording. Item scoring ranged from "*1-Never*" to "*7-All the time*".

Table C.4

Item means, standard deviations, and zero-order correlations between desired privacy items (Study 2.B)

	Item	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	No vis distractions long	3.51	1.80	-																
2	No vis distractions	3.22	1.69	.73**	-															
3	No noise distractions long	4.14	1.88	.76**	.69**	-														
4	Visually calm env	3.88	1.71	.75**	.70**	.64**	-													
5	No noise distractions	4.16	1.63	.62**	.67**	.74**	.60**	-												
6	Quiet env	4.28	1.57	.55**	.57**	.67**	.67**	.71**	-											
7	Min acoustical distractions	4.59	1.72	.52**	.49**	.52**	.55**	.59**	.50**	-										
8	Uninterrupted by queries	3.94	1.67	.54**	.53**	.50**	.44**	.38**	.50**	.27**	-									
9	Not asked anything long	3.98	1.70	.58**	.57**	.57**	.49**	.46**	.51**	.28**	.80**	-								
10	Less accessible	3.08	1.68	.27**	.28**	.19*	.26**	.16	.29**	.05	.63**	.51**	-							
11	No social engaging	3.65	1.78	.42**	.38**	.37**	.30**	.40**	.39**	.23*	.58*	.60**	.41**	-						
12	Without others seeing	2.80	1.70	.35**	.26**	.32**	.32**	.40**	.40**	.30**	.380**	.25**	.15	.30**	-					
13	Where keep work conf	2.68	1.63	.39**	.35**	.30**	.36**	.30**	.32**	.28**	.42**	.27**	.20*	.25**	.67**	-				
14	Not looking over shoulder	3.36	1.85	.46**	.40**	.46**	.44**	.48**	.48**	.35**	.44**	.36**	.20*	.39**	.78**	.58**	-			
15	Conf conversations	3.70	1.65	.35**	.35**	.38**	.26**	.32**	.40**	.28**	.38**	.36**	.22*	.42**	.47**	.41**	.52**	-		
16	Conv without dist others	4.79	1.55	.40**	.41**	.39**	.37**	.32**	.40**	.43**	.45**	.45**	.15	.28**	.30**	.37**	.38**	.49**	-	
17	Non-conf conversations	4.04	1.53	.32**	.39**	.24*	.36**	.23*	.30**	.26**	.37**	.40**	.26**	.43**	.22*	.40**	.32**	.62**	.51**	-

Note. $n = 109$. *$p < .05$, **$p < .01$ (2-tailed). See Study 1 for item wording. Item scoring ranged from "*1-Never*" to "*7-All the time*".

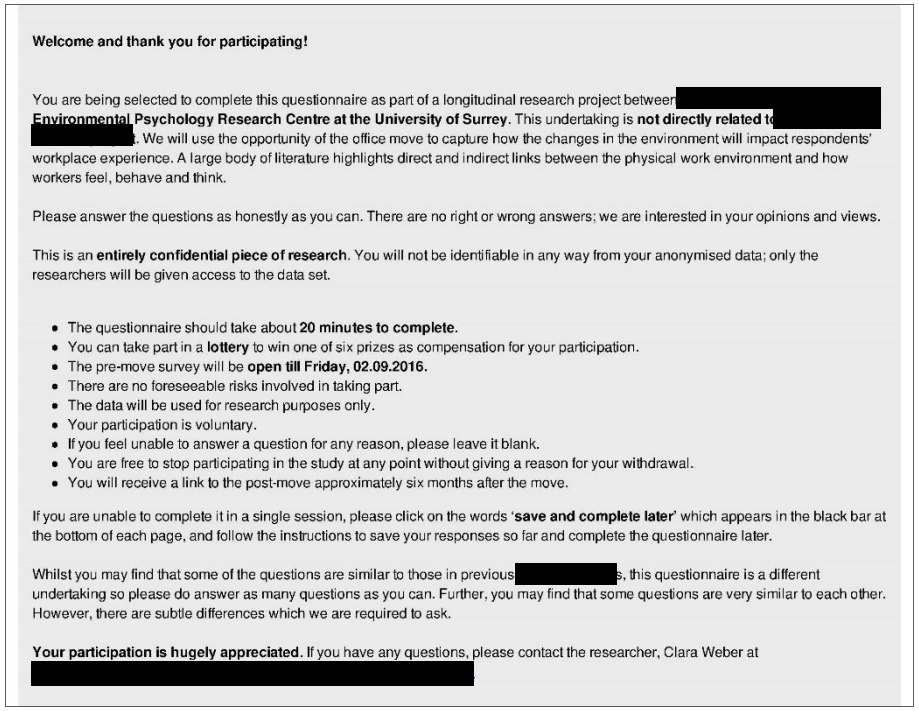
Table C.5

Numbered items (Study 2.B)

1	... work without visual distractions for a long period of one hour or more at a time
2	... work with no visual distractions around me
3	... work without noise distractions for a long period of one hour or more at a time
4	... be in a “visually calm” environment
5	... work with no acoustical distractions around me
6	… be in a quiet environment with not much noise from others around me
7	… have minimal acoustical distractions from others around me when having a phone call
8	... work uninterrupted by queries from my co-workers
9	... work for a long period of one hour or more at a time without being asked for personal or work-related information
10	… be less accessible to my co-workers than I usually am
11	... work without socially engaging with anyone around me
12	... work without others seeing what I am working on
13	... work where I can keep what I am working on confidential
14	... work where I do not feel that others can look over my shoulder
15	... have confidential conversations with my co-workers or phone calls without others listening in
16	… have conversations with my co -workers or phone calls without distracting others
17	... have non-confidential conversations with my co-workers without others listening in

Appendix D: Materials used in Studies 2, 3, and 4

Studies 2, 3, and 4 Questionnaire



Welcome and thank you for participating!

You are being selected to complete this questionnaire as part of a longitudinal research project between [redacted] **Environmental Psychology Research Centre at the University of Surrey**. This undertaking is **not directly related to** [redacted]. We will use the opportunity of the office move to capture how the changes in the environment will impact respondents' workplace experience. A large body of literature highlights direct and indirect links between the physical work environment and how workers feel, behave and think.

Please answer the questions as honestly as you can. There are no right or wrong answers; we are interested in your opinions and views.

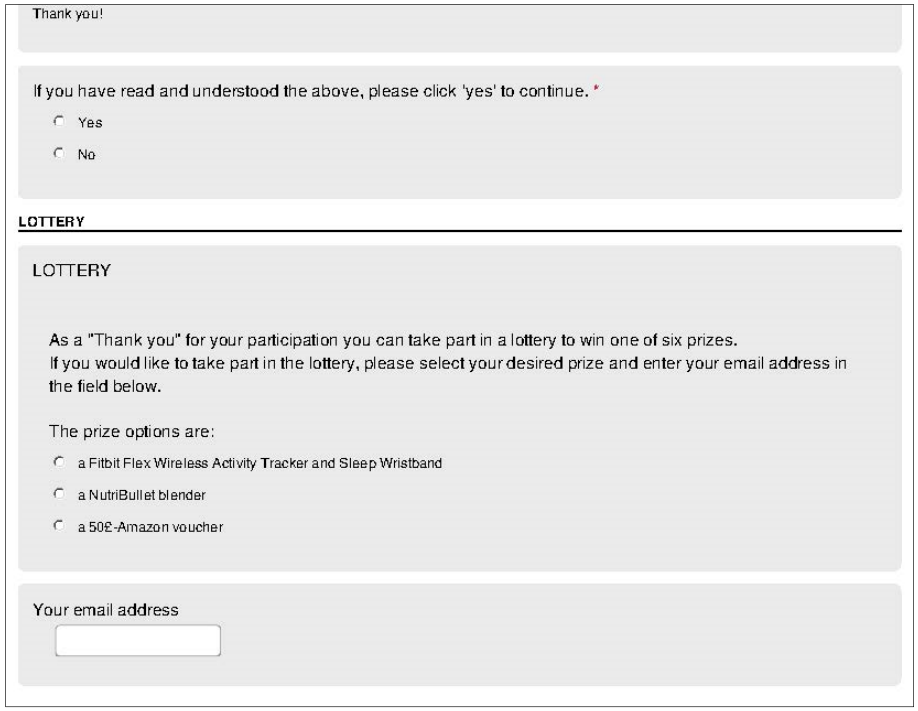
This is an **entirely confidential piece of research**. You will not be identifiable in any way from your anonymised data; only the researchers will be given access to the data set.

- The questionnaire should take about **20 minutes to complete**.
- You can take part in a **lottery** to win one of six prizes as compensation for your participation.
- The pre-move survey will be **open till Friday, 02.09.2016.**
- There are no foreseeable risks involved in taking part.
- The data will be used for research purposes only.
- Your participation is voluntary.
- If you feel unable to answer a question for any reason, please leave it blank.
- You are free to stop participating in the study at any point without giving a reason for your withdrawal.
- You will receive a link to the post-move approximately six months after the move.

If you are unable to complete it in a single session, please click on the words '**save and complete later**' which appears in the black bar at the bottom of each page, and follow the instructions to save your responses so far and complete the questionnaire later.

Whilst you may find that some of the questions are similar to those in previous [redacted]s, this questionnaire is a different undertaking so please do answer as many questions as you can. Further, you may find that some questions are very similar to each other. However, there are subtle differences which we are required to ask.

Your participation is hugely appreciated. If you have any questions, please contact the researcher, Clara Weber at [redacted]



Thank you!

If you have read and understood the above, please click 'yes' to continue. *

- Yes
- No

LOTTERY

LOTTERY

As a "Thank you" for your participation you can take part in a lottery to win one of six prizes.
If you would like to take part in the lottery, please select your desired prize and enter your email address in the field below.

The prize options are:

- a Fitbit Flex Wireless Activity Tracker and Sleep Wristband
- a NutriBullet blender
- a 50£-Amazon voucher

Your email address

The record of your email address will be stored separately from your responses and will be deleted after the prize draw.

(untitled)

In order to keep the survey anonymous please use the last 2 digits of your mobile phone number and the 2 digits of your birthday month (ranges from 01 for January to 12 for December) followed by the last 2 digits of your postcode as your unique Respondent ID.

This way your pre-and post-move respondents can be matched without using identifying information.

Respondent ID *

Please enter your Respondent ID again for verification *

Is this a pre-move or a post-move response? *

- Pre-move (Summer 2016)
- Post-move (Spring 2017)

BACKGROUND INFO - A

Part 1: Background Information Pre-Move

VALIDATION Must be numeric

1. How old are you?

Please write down your age in years (e.g. 35)

2. What is your gender?

- Female
- Male

VALIDATION
LOGIC Show/hide trigger exists.

3. Which team do you work in? *

Administration
[redacted]
Architecture
Building Engineering
Landscape Team
Marketing & Communications
Planning
Programme Management & Major Projects
Project Management
[redacted]
Sustainable Development Group
Urban Design
Other team

VALIDATION
LOGIC Hidden unless: Question "Which team do you work in?" #3 is one of the following answers ("Other team")

Other team (please specify):

VALIDATION
LOGIC Show/hide trigger exists.

4. Which is your 'base' office location? *

[redacted]
Other

VALIDATION
LOGIC Hidden unless: Question "Which is your 'base' office location?" #4 is one of the following answers ("Other")

Other 'base' office location (please specify):

5. Approximately, how many years have you worked in your base office building?

Please write in years also if you have worked in the building for less than a year (e.g. "0.5" for half a year).

VALIDATION

6. Which of the following best describes your role or level in [redacted]

- Director / Regional Director
- Associate Director
- PRINCIPAL Engineer/Architect/Designer/Consultant/other equivalent
- SENIOR Engineer/Architect/Designer/Consultant/other equivalent
- Engineer/Architect/Designer/Consultant/other equivalent
- JUNIOR or GRADUATE Engineer/Architect/Designer/Consultant/other equivalent
- Technician / Administrative Support Services

7. Do you have an open plan desk that is assigned to you in your base office building?

- Yes
- No

VALIDATION Must be percentage Whole numbers only

WHERE YOU WORK

8. During a typical week, what percentage of your time do you spend working in the following locations?

	At your desk (or the desk you are currently using) in your 'base' office building
	Working elsewhere in your 'base' office building
	In another office building (belonging to [redacted] or to a different organization such as a customer or supplier)
	Working in transit (including in cafes, on transport, in hotel rooms)
	Working at home

0 out of 100% Total

VALIDATION Must be percentage Whole numbers only

HOW YOU WORK

9. During a typical week, **when you are working in your 'base' office building,** how is your working time split across the following activities?

	Working individually
	Working with members of your team, face-to-face
	Working with members of another team or external people, face-to-face
	Collaborating virtually / on teleconferences or videoconferences with colleagues or external people

0 out of 100% Total

*This should total 100% of your working time **in the building where you are based.***

TOO MUCH CONTACT, COPING - A

Part 2: Your Workplace Experience

This section describes different situations or conditions at work which relate to **different types of interactions with co-workers**. Please rate, when you were working in your base office building,

a) how often you **wanted** the following levels of interaction with co-workers in order to do your work

b) **of the times you wanted** to work in these conditions, how often you **achieved** it on average during the last 4 weeks

VALIDATION

10. ACOUSTICAL AND VISUAL DISTRACTIONS

	In the last 4 weeks when working amongst my colleagues in the open plan office, I **wanted to** ...							Of the times I wanted to work in this condition in my base office building, I **was able to achieve it.**						
	Never (1)	(2)	(3)	(4)	(5)	(6)	All the time (7)	Never (1)	(2)	(3)	(4)	(5)	(6)	All the time (7)
… be in a quiet environment with **not much** noise from others around me	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... be in a "visually calm" environment with **not much** happening around me	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... work with **no** visual distractions around me	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... work with **no** acoustical distractions around me	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... have **minimal** acoustical distractions from others around me when having a phone call	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... work without noise distractions for a long period of one hour or more at a time	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... work without visual distractions for a long period of one hour or more at a time	○	○	○	○	○	○	○	○	○	○	○	○	○	○

11. CONFIDENTIALITY

	In the last 4 weeks when working amongst my colleagues in the open plan office, I **wanted to** ...							Of the times I wanted to work in this condition in my base office building, I **was able to achieve it.**						
	Never (1)	(2)	(3)	(4)	(5)	(6)	All the time (7)	Never (1)	(2)	(3)	(4)	(5)	(6)	All the time (7)
… have conversations with my co-workers or phone calls without distracting others	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... have non-confidential conversations with my co-workers without others listening in	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... have confidential conversations with my co-workers or phone calls without others listening in	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... work with co-worker(s) somewhere physically separated from other groups	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... have private team work sessions removed from other groups	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... work where I can keep what I am working on confidential	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... work without others seeing what I am working on	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... work where I do not feel that others can look over my shoulder	○	○	○	○	○	○	○	○	○	○	○	○	○	○

	In the last 4 weeks when working amongst my colleagues in the open plan office, I **wanted to** ...							Of the times I wanted to work in this condition in my base office building, I **was able to achieve it.**						
	Never (1)	(2)	(3)	(4)	(5)	(6)	All the time (7)	Never (1)	(2)	(3)	(4)	(5)	(6)	All the time (7)
… be less accessible to my co-workers than I usually am	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... work uninterrupted by queries from my co-workers	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... work for a long period of one hour or more at a time without being asked for personal or work-related information	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... work without socially engaging with anyone around me	○	○	○	○	○	○	○	○	○	○	○	○	○	○

VALIDATION

13. TIME SPENT AWAY FROM OTHERS

	In the last 4 weeks when working amongst my colleagues in the open plan office, I **wanted to** ...							Of the times I wanted to work in this condition in my base office building,I **was able to achieve it.**						
	Never (1)	(2)	(3)	(4)	(5)	(6)	All the time (7)	Never (1)	(2)	(3)	(4)	(5)	(6)	All the time (7)
…work where I am all by myself	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... work in a secluded area	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... work where I do not have to talk to anyone	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... work without socially engaging with anyone around me	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... work where I do not have to see anyone	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... work where I cannot be observed by anyone	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... work where I cannot hear anyone	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... work in an environment where I am anonymous	○	○	○	○	○	○	○	○	○	○	○	○	○	○
… work where no one recognizes me	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... work amongst other people without being accessible to my co-workers	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... work where I cannot be observed by my co-workers	○	○	○	○	○	○	○	○	○	○	○	○	○	○

VALIDATION

14. COPING WITH TOO MUCH CONTACT

Please select N/A if situations as mentioned below did not occur to you in the last 4 weeks.

	In the last 4 weeks, when I was in situations in which I **wanted less contact** with my co-workers in the base office building, I **mostly**...					
	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)	N/A
…could change the situation or do something about it.	○	○	○	○	○	○
... could think of lots of ways to do so.	○	○	○	○	○	○
... had to accept that I couldn't achieve it and get used to the situation.	○	○	○	○	○	○
… needed to hold myself back from dealing with it as I wanted.	○	○	○	○	○	○
... couldn't deal with it in the way I wanted as it would have made things difficult for me.	○	○	○	○	○	○

TOO LITTLE CONTACT, COPING, CONTROL - A

Similar to the previous section, this one describes different situations or conditions at work which relate to **different types of interactions with co-workers**. Please rate, when you were working in your base office building,

a) how often you **wanted** the following levels of interaction with co-workers in order to do your work

b) **of the time you wanted** to work in these conditions, how often you **achieved** it on average during the last 4 weeks

VALIDATION

15. ACOUSTICAL AND VISUAL STIMULATION

	In the last 4 weeks when working amongst my colleagues in the open plan office, I **wanted to** ...							Of the times I wanted to work in this condition in my base office building, I **was able to achieve it.**						
	Never (1)	(2)	(3)	(4)	(5)	(6)	All the time (7)	Never (1)	(2)	(3)	(4)	(5)	(6)	All the time (7)
… be in a "buzzing" environment where I can hear lots of co-workers around me	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... be in visually stimulating and exciting environment with lots of "things happening" around me	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... work where there are clear lines of sight enabling me to see my co-workers around me	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... work where I can hear my co-workers around me	○	○	○	○	○	○	○	○	○	○	○	○	○	○

VALIDATION

16. FACE-TO-FACE COLLABORATION & BEING SOCIAL

	In the last 4 weeks when working amongst my colleagues in the open plan office, I **wanted to** ...							Of the times I wanted to work in this condition in my base office building, I **was able to achieve it.**						
	Never (1)	(2)	(3)	(4)	(5)	(6)	All the time (7)	Never (1)	(2)	(3)	(4)	(5)	(6)	All the time (7)
… share my work with my co-workers in impromptu catch-up or review sessions	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... have collaborative sessions with my co-workers for a long period of two hours or more	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... share my work with my co-workers in scheduled meetings	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... have informal conversations with my co-workers	○	○	○	○	○	○	○	○	○	○	○	○	○	○
… socialize with my co-workers	○	○	○	○	○	○	○	○	○	○	○	○	○	○
… be social with my colleagues for a long period of 20 minutes or more	○	○	○	○	○	○	○	○	○	○	○	○	○	○
… work amongst my colleagues to have company	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... work where I am not all by myself	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... work alongside my co-workers for personal support and encouragement	○	○	○	○	○	○	○	○	○	○	○	○	○	○

VALIDATION

17. FACE-TO-FACE COLLABORATION & SUPPORT

	In the last 4 weeks when working amongst my colleagues in the open plan office, I **wanted to** ...							Of the times I wanted to work in this condition in my base office building, I **was able to achieve it.**						
	Never (1)	(2)	(3)	(4)	(5)	(6)	All the time (7)	Never (1)	(2)	(3)	(4)	(5)	(6)	All the time (7)
…work alongside a co-worker with whom I am sharing project work for a **task-specific length** (i.e. multiple hours) for ease of interaction	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... work alongside a co-worker with whom I am sharing project work for a **project-specific length** (i.e. multiple days) for ease of interaction	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... have easy access to my co-workers so I can stay informed about their work	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... have easy access to my co-workers in order to help out when questions arise	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... be easily accessible to my co-workers for answering their queries	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... have easy access to my co-workers for my queries	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... have easy access to my co-workers to get work related help, support and knowledge exchange	○	○	○	○	○	○	○	○	○	○	○	○	○	○
... have easy access to senior co-workers for support and guidance	○	○	○	○	○	○	○	○	○	○	○	○	○	○
… have easy access to senior co-workers for decision making	○	○	○	○	○	○	○	○	○	○	○	○	○	○

VALIDATION

18. COPING WITH TOO LITTLE CONTACT

Please select N/A if situations as mentioned below did not happen to you in the last 4 weeks.

	In the last 4 weeks, when I was in situations in which I **wanted more contact** with co-workers in the base office building, I **mostly**...					
	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)	N/A
…could change the situation or do something about it.	○	○	○	○	○	○
... could think of lots of ways to do so.	○	○	○	○	○	○
... had to accept that I couldn't achieve it and get used to the situation.	○	○	○	○	○	○
… needed to hold myself back from dealing with it as I wanted.	○	○	○	○	○	○
... couldn't deal with it in the way I wanted as it would have made things difficult for me.	○	○	○	○	○	○

VALIDATION

19. GENERAL CONTROL OVER INTERACTIONS

Please rate your agreement with the following statements about your **perception of control over interactions and contact** with co-workers in your base office building during the last 4 weeks.

	In the last 4 weeks, ...						
	Strongly disagree (1)	Disagree (2)	Slightly disagree (3)	Neither agree nor disagree (4)	Slightly agree (5)	Agree (6)	Strongly agree (7)
...I was able to control how much contact I had with co-workers in this office.	○	○	○	○	○	○	○
... I was able to control the timing of my contact with co-workers in this office.	○	○	○	○	○	○	○
... I was able to control the duration of my contact with co-workers in this office.	○	○	○	○	○	○	○
... I was able to control the number of contacts I had with co-workers in this office.	○	○	○	○	○	○	○

20. IN COMPARISON TO A TYPICAL MONTH - MORE OR LESS BUSY

Please indicate whether you feel that on average in the last 4 weeks there were more or less people (co-workers, visitors etc.) in your base office than in a typical month.

Much less people in the office	Less people in the office	Similar number of people in the office	More people in the office	Much more people in the office
○	○	○	○	○

Part 3: Your Workplace Culture & Office Characteristics

VALIDATION

21. CHOOSING WHERE YOU WORK

	In the last 4 weeks,						
	Strongly disagree (1)	Disagree (2)	Slightly disagree (3)	Neither agree nor disagree (4)	Slightly agree (5)	Agree (6)	Strongly agree (7)
...I felt empowered to work wherever I thought was right for me.	○	○	○	○	○	○	○
...even if I could have worked somewhere else I felt I should work at my desk.	○	○	○	○	○	○	○
... the culture in my team prevented me from working somewhere other than my desk.	○	○	○	○	○	○	○

VALIDATION

22. PROTOCOLS

This question refers to protocols about the use of space in your base office building.

Protocols refer to more or less formal guidelines or agreements about work activities which are either suitable or should be avoided at different office settings (i.e. open plan desk, touch down benches, project spaces, meeting rooms).

An example of such an agreement would be to avoid having a conference call on speaker phone at an open plan desk.

Please select N/A if you think that your team does not have any guidelines or agreements about the use of office spaces.

	Strongly disagree (1)	Disagree (2)	Slightly disagree (3)	Neither agree nor disagree (4)	Slightly agree (5)	Agree (6)	Strongly agree (7)	N/A
In the last 4 weeks, people in this office adhered to the protocols about the use of space.	○	○	○	○	○	○	○	○

VALIDATION Min = 0 Max = 100

23. WORK SETTINGS - 1

The following two questions refer to work settings which are different places in your office where you can work from. Work settings encompass for example open plan desks, touchdown benches, project tables, informal seating areas, meeting rooms, quiet rooms etc.

Please use the slider below to rate the availability of different work settings **in your base office building** where you can work from. The scale ranges from "0 - Very few settings available" to "+100 - Lots of settings available".

Very few settings available — Some settings available — Lots of settings available

VALIDATION

24. WORK SETTINGS - 2

	Strongly disagree (1)	Disagree (2)	Slightly disagree (3)	Neither agree nor disagree (4)	Slightly agree (5)	Agree (6)	Strongly agree (7)
The design of my current base office encourages me to use different settings that best support the tasks that I am undertaking	○	○	○	○	○	○	○

VALIDATION

25. GROUP COHESIVENESS

Cohesiveness is a group characteristic involving whether members like one another, help each other, work well together, communicate fully and openly, and coordinate their work efforts.

	Very low (1)	Low (2)	Medium (3)	High (4)	Very high (5)
In the last 4 weeks our team's group cohesiveness was ...	○	○	○	○	○

26. Please indicate the approximate number of people (not just members of your team) working around you but only count the ones that are in your field of view when sitting at *your* open plan desk (or the open plan desk you use most of the time).

VALIDATION

28. YOUR MOOD

This scale consists of a number of words that describe different feelings and emotions. Indicate to what extent you have felt this way during the past 4 weeks **in general** (not just at work).

	Very slightly or not at all (1)	A little (2)	Moderately (3)	Quite a bit (4)	Extremely (5)
Interested	○	○	○	○	○
Distressed	○	○	○	○	○
Excited	○	○	○	○	○
Upset	○	○	○	○	○
Strong	○	○	○	○	○
Guilty	○	○	○	○	○
Scared	○	○	○	○	○
Hostile	○	○	○	○	○
Enthusiastic	○	○	○	○	○
Proud	○	○	○	○	○

VALIDATION

27. WORKPLACE SATISFACTION

	In the last 4 weeks, ...						
	Strongly disagree (1)	Disagree (2)	Slightly disagree (3)	Neither agree nor disagree (4)	Slightly agree (5)	Agree (6)	Strongly agree (7)
...I was satisfied with the workplace environment in my base office building.	○	○	○	○	○	○	○
...I felt comfortable in the workplace environment in my base office building.	○	○	○	○	○	○	○
...the workplace environment in my base office building supported me well in the daily tasks I had to perform.	○	○	○	○	○	○	○

EXPERIENCE OF YOUR WORK - A

Part 4: Your Experience of Your Work

Please remember that your answers will be treated with the utmost confidentiality.

VALIDATION

	Very slightly or not at all (1)	A little (2)	Moderately (3)	Quite a bit (4)	Extremely (5)
Irritable	○	○	○	○	○
Alert	○	○	○	○	○
Ashamed	○	○	○	○	○
Inspired	○	○	○	○	○
Nervous	○	○	○	○	○
Determined	○	○	○	○	○
Attentive	○	○	○	○	○
Jittery	○	○	○	○	○
Active	○	○	○	○	○
Afraid	○	○	○	○	○

VALIDATION

29. JOB SATISFACTION

	In the last 4 weeks, ...				
	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
...I have been satisfied with my job.	○	○	○	○	○
...I would have been happy to recommend my job to others.	○	○	○	○	○
...I did regret my decision to work here.	○	○	○	○	○
...I have been satisfied with the opportunities I have been given to apply my knowledge and skills at work.	○	○	○	○	○
...I have been satisfied with the opportunities I have been given for learning and development at work	○	○	○	○	○

VALIDATION

30. JOB PERFORMANCE

	In the last 4 weeks,				
	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
...my work was of high quality.	○	○	○	○	○
...I could accomplish a great deal each day.	○	○	○	○	○
...I did a large amount of work each day.	○	○	○	○	○
...my work outcome was creative.	○	○	○	○	○
...the design of my workplace in my base office building enabled me to work productively.	○	○	○	○	○

VALIDATION

31. JOB DEMAND

	In the last 4 weeks,				
	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
...my job involved an excessive amount of work.	○	○	○	○	○
...I did not have enough time to get my work done properly.	○	○	○	○	○
...I had to work very hard.	○	○	○	○	○
...I had to work very fast.	○	○	○	○	○
...I had to deal with conflicting demands.	○	○	○	○	○
...we did not have enough resources to do our job.	○	○	○	○	○

VALIDATION

32. WORK STRESS

	In the last 4 weeks,				
	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
...I felt a great deal of stress because of my job.	○	○	○	○	○
...very stressful things happened to me at work.	○	○	○	○	○
...I almost never felt stressed at work.	○	○	○	○	○

	In the last 4 weeks,				
	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
... I was able to concentrate fully on my job when I was at work.	○	○	○	○	○
... when I was in my office, I could work with few distractions or interruptions.	○	○	○	○	○
... interruptions at work often prevented me from giving my full attention to my job.	○	○	○	○	○
... I could talk with my co-workers in confidence while in my office.	○	○	○	○	○
... it was difficult to work in my office because I had to worry about disturbing others.	○	○	○	○	○
... I was unable to have a personal or private discussion while at work.	○	○	○	○	○

Part 5: Your Well-being at Work

Many people experience a sense of extreme or excessive tiredness during and at the end of the work day. This excessive sense of tiredness is called fatigue and can involve one's **physical**, **mental**, and **emotional resources**.

For each of the following three questions, check the box that most accurately reflects how often you experience each aspect of fatigue.

Please remember that your answers will be treated with the utmost confidentiality.

VALIDATION

33. PHYSICAL FATIGUE

Physical fatigue involves extreme physical tiredness and an inability to engage in physical activity.

	During the PAST 4 WEEKS, how often did you ...				
	Never	Less than once a month	At least once a month	At least once a week	Everyday
... feel physically exhausted at the end of the workday?	○	○	○	○	○
... feel physically worn out at the end of the workday?	○	○	○	○	○
... want to physically shut down at the end of the workday?	○	○	○	○	○
... feel physically drained at the end of the workday?	○	○	○	○	○
... want to avoid anything that took too much physical energy at the end of the workday?	○	○	○	○	○
... have difficulty engaging in physical activity at the end of the workday?	○	○	○	○	○

VALIDATION

34. MENTAL FATIGUE

Mental fatigue involves extreme mental tiredness and an inability to think or concentrate.

	During the PAST 4 WEEKS, how often did you ...				
	Never	Less than once a month	At least once a month	At least once a week	Everyday
... feel mentally exhausted at the end of the workday?	○	○	○	○	○
... have difficulty thinking and concentrating at the end of the workday	○	○	○	○	○
... want to mentally shut down at the end of the workday?	○	○	○	○	○
... feel mentally drained at the end of the workday?	○	○	○	○	○
... want to avoid anything that took too much mental energy at the end of the workday?	○	○	○	○	○
... feel mentally worn out at the end of the workday?	○	○	○	○	○

VALIDATION

35. EMOTIONAL FATIGUE

Emotional fatigue involves extreme emotional tiredness and an inability to feel or show emotions.

	During the PAST 4 WEEKS, how often did you ...				
	Never	Less than once a month	At least once a month	At least once a week	Everyday
... feel emotionally exhausted at the end of the workday?	○	○	○	○	○
... have difficulty showing and dealing with emotions at the end of the workday?	○	○	○	○	○
... want to emotionally shut down at the end of the workday?	○	○	○	○	○
... feel emotionally drained at the end of the workday?	○	○	○	○	○
... want to avoid anything that took too much emotional energy at the end of the workday?	○	○	○	○	○
... feel emotionally worn out at the end of the workday?	○	○	○	○	○

MOVE FEELINGS - A

VALIDATION Min = -100 Max = +100

36. YOUR FEELINGS ABOUT THE MOVE

Please use the slider below to indicate how you feel about the upcoming move.

The scale ranges from "-100 - Extremely negative feelings" to "+100 - Extremely positive feelings".

Extremely negative feelings — Neither positive nor negative feelings — Extremely positive feelings

Final comments and 'submit' button

VALIDATION

If you have any further comments you would like to make, please add these below:

This is the end of the pre-move questionnaire.

After clicking the 'submit' button below, you should see a message confirming that we have received your answers.
If you don't see this message please contact [redacted] as soon as possible.

Feeling overwhelmed and stressed is a tough place to be. If are experiencing these feelings because of your work and are not sure how to handle the situation please approach your line manager.

Thanks again for taking part!

Thank you for completing the pre-move survey! Your answers have been successfully received.

Approximately six month after your move to the new office you will receive a link to the post-move survey.

Appendix E: Supplementary Results Study 3

Table E.1

Covariances between error terms of endogenous variables and exogenous variables (Study 3)

Variable	*Estimate*	*r*	*SE*	*p*
Protocols < > Settings	.49	.19	.18	< .01
Autonomy < > Settings	1.35	.28	.34	< .001
Autonomy < > Protocols	.22	.04	.35	.54
Job demand < > Protocols	-2.06	-.27	.53	< .001
Job demand < > Settings	-1.46	-.21	.48	< .01
Job demand < > Autonomy	-.002	.00	.94	.99
e Stress < > e Emotional fatigue	4.00	.32	.88	< .001
e Workplace satisfaction < > e Emotional fatigue	-2.27	-.10	1.25	.07
e Workplace satisfaction < > Protocols	1.32	.21	.43	.002
e Workplace satisfaction < > Settings	2.72	.45	.45	< .001
e Workplace satisfaction < > Autonomy	2.30	.19	.83	< .01

Note. $n = 220$.

Table E.2

Variances of error terms of endogenous variables and exogenous variables (Study 3)

Variable	*Estimate*	*SE*	*p*
Protocols	2.81	.27	< .001
Settings	2.44	.23	< .001
Autonomy	9.59	.92	< .001
Job demand	20.08	1.92	< .001
e Privacy fit	4778.76	456.68	< .001
e Coping appraisal	11.92	1.14	< .001
e Stress	4.53	.43	< .001
e Emotional fatigue	33.96	3.24	< .001
e Workplace satisfaction	14.71	1.45	< .001

Note. $n = 220$.

Explanation of Model Fit Indices

Firstly, absolute fit indices will were reported. These indices determine how well the proposed (theory) path model fits the sampled data in comparison to no model (Jörekog and Sörborn, 1993; Hooper, Coughlan, & Mullen, 2008). As absolute fit indices Chi-square tests and RMSEA will be used as the first is a traditional measure for evaluating overall model fit (Hooper et al., 2008) and the latter has been coined as "one of the most informative fit indices" (Diamantopoulos and Siguaw, 2000, p. 85 in Hoon et al. 2008, p. 54). The Chi-Square value "assesses the magnitude of discrepancy between the sample and fitted covariances matrices' (Hu and Bentler, 1999, p.2 in Hoon et al. 2008, p.53). The Chi-Square value of the proposed path model suggests a good model fit (Barrett, 2007), as it resulted in an insignificant p-value, χ^2 (9) = 15.18, p = .09. However, the Chi-Square has limitations. Limitations, relevant for this study, include its sensitivity to sample size and its lack of power to determine differentiated model fits when small samples are used (Kenny and McCoach, 2003). Hence, there is a risk of incorrectly rejecting the null-hypothesis (poor fit). Therefore, the result should be interpreted with caution. The Root Mean Square Error of Approximation (RMSEA) determines how well the proposed model would match the populations' covariance matrix (Byrne, 1998). The present model has a RMSEA of .05 (90% CI .00, .10) which, according to new and more stringent guidelines (Hu & Bentler, 1999, Steiger, 2007), represents a good model fit as it is below the cut-off value .06. However, the confidence interval upper limit should ideally be less than .08 for a well-fitting model whereas the present upper limit is .10 and therewith including a 10% possibility of incorrectly rejecting the null-hypothesis (poor fit) (McQuitty, 2004, Hooper et al. 2008).

Secondly, incremental fit indices (also known as relative or comparative fit indices; Hooper et al., 2008) were reported. Their calculations rely on comparisons of the proposed model with a baseline or null model. The null hypothesis for this case is that all variables are uncorrelated (McDonald & Ho, 2002). NFI and CFI are incremental fit indices which will be presented. The Normed-Fit Index (NFI; Bentler and Bonnet,1980) value "assesses the model by comparing the χ2 value of the model to the χ2 of the null (baseline) model. The null/independence model is the worst case scenario as it specifies that all measured variables are uncorrelated" (Hooper et al. 2008, p. 55). The proposed model has a NFI of .97 and is therewith above the more stringent threshold of ≥ .95 (Hu and Bentler, 1999). Although the drawback of NFI is its sample size sensitivity, it can result in underestimating fit for samples less than 200 (Mulaik et al, 1989; Bentler, 1990, Hooper et al. 2008); a problem that did not occur in this analysis. The Comparative Fit Index (CFI; Bentler, 1990) follows similar

principles as the NFI but takes sample size into consideration. It seems to perform particularly well on small sample sizes (Tabachnick and Fidell, 2007). According to the CFI value of the tested model .987, it has a good as it is above the newly adjusted cut-off ≥ 0.95 (Hu and Bentler, 1999).

Thirdly, the parsimony fit index PNFI were reported. A parsimony index takes into account the number of degrees of freedom for testing both the model being evaluated and the baseline model (James, Mulaik, & Brett, 1982). Experts in the field have strongly recommended to include parsimony fit indices in tandem with other measures of goodness-of-fit measures (i.e. Mulaik et al 1989, Crowley and Fan, 1997). Parsimony fit measures attempt to compensate for the complexity of models. They reduce the overall size of the goodness-of-fit measures by a constant known as the parsimony ratio. Relying only on goodness-of-fit measures can be misleading because the estimation process of a complex model relies on the sample data which can "results in a less rigorous theoretical model that paradoxically produces better fit indices" (Hooper et al., 2008, p. 55). So far, no threshold levels have been recommended for these indices, but generally the closer they are 1.0, the better fit the model should have. As of the nature of the calculation, the more complex the model, the lower the fit index. The present model has a PNFI value .29 which suggests a poor fit. However, it has been acknowledged that parsimony-based indices have lower values than the threshold level generally perceived as acceptable for other normed indices of fit (i.e. Hooper et al, 2008). Some scholars consider it as unlikely to achieve parsimony-based indices above .70 (Byrne, 1998, Kelloway, 1998) and good fit can be achieved with indices within the .50 region (Mulaik et al, 1989). Nonetheless, the result should be interpreted with caution.

Appendix F: Supplementary Results Study 4

Change Score Associations

Change scores were computed for each of the variables (subtracting time 1 scores from time 2 scores) and were correlated. Results support most of the expected associations as can be seen in table F.1. Regarding hypothesis 4ab, change in privacy fit was associated with changes in all contextual variables (work settings, protocols, and location autonomy), whereas changes in coping appraisal was associated with change in work settings but not with change in location autonomy. Regarding hypothesis 5ab, changes in privacy fit and coping appraisal were both associated with changes in workplace and job satisfaction, emotional and mental fatigue but not with stress.

Table F.1

Zero-order correlations between change scores (Study 4)

	Variable	1	2	3	4	5	6	7	8	9	10	11
1	Δ Privacy	-										
2	Δ Coping appraisal	-.11	-									
3	Δ Emotional fatigue	-.16	.32*	-								
4	Δ Mental fatigue	-.25*	.29*	.43	-							
5	Δ Stress	-.07	.16	.30*	.31*	-						
6	Δ Job demand	-.17	.18	.09	.15	.33**	-					
7	Δ Workplace satisfaction	.26*	-.41***	-.17	-.32*	-.17	-.15	-				
8	Δ Job satisfaction	.10	-.39**	-.34**	-.25*	-.36**	-.09	.40***	-			
9	Δ Autonomy	.26*	-.02	-.18	-.14	.17	-.20	.27*	-.10	-		
10	Δ Protocols	.30**	-.10	-.12	-.21	-.13	-.17	.13	-.09	.21	-	
11	Δ Settings	.26*	-.25*	-.07	-.13	-.03	-.16	.55**	.24	.20	-.04	-

Note. $n = 61$. *$p < .05$, **$p < .01$.

Table F.2

Autoregression: Context variables on privacy fit (Study 4)

	Dependent variable									
	Privacy fit Time 2									
	B	*SE B*	*β*	*t*	*F*	*p*	*Adj. R^2*	*ΔF*	*Δp*	*ΔR^2*
Independent variable										
Step 1					17.85	< .001	.22			
Privacy fit Time 1	.55	.13	.48***	4.23						
Step 2					5.03	.002	.21	0.82	.49	.03
Privacy fit Time 1	.50	.14	.44***	3.54						
Protocols Time 1	.25	.38	.08	0.67						
Settings Time 1	-.01	.45	-.004	-0.03						
Autonomy Time 1	.54	.40	.17	1.37						
Step 3					8.44	< .001	.47	9.81	< .001	.26
Privacy fit Time 1	.38	.12	.33***	3.14						
Protocols Time 1	-.09	.35	-.03	-0.25						
Settings Time 1	.01	.37	.003	0.03						
Autonomy Time 1	-.42	.42	-.13	-1.02						
Protocols Time 2	.87	.31	.30**	2.79						
Settings Time 2	.95	.37	.29*	2.55						
Autonomy Time 2	.79	.42	.25	1.86						

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table F.3

Autoregression: Context variables on coping appraisal (Study 4)

	Dependent variable									
	Coping appraisal Time 2									
	B	*SE B*	*β*	*t*	*F*	*p*	*Adj. R^2*	*ΔF*	*Δp*	*ΔR^2*
Independent variable										
Step 1					19.65	< .001	.24	19.65		
Coping appraisal Time 1	.50	.11	.50***	4.43						
Step 2					10.03	< .001	.38	5.36	.003	.25
Coping appraisal Time 1	.34	.12	.35***	2.94						
Protocols Time 1	.08	.07	.13	1.23						
Settings Time 1	-.02	.08	-.04	-0.31						
Autonomy Time 1	.26	.07	.43***	3.85						
Step 3					10.16	< .001	.52	6.44	.001	.16
Coping appraisal Time 1	.17	.11	.17	1.54						
Protocols Time 1	.05	.07	.09	0.82						
Settings Time 1	.00	.07	.00	.00						
Autonomy Time 1	.13	.08	.21	1.70						
Protocols Time 2	.06	.06	.11	1.07						
Settings Time 2	.19	.07	.31**	2.90						
Autonomy Time 2	.15	.08	.25*	1.92						

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table F.4

Autoregression: Privacy fit on job satisfaction (Study 4)

	Dependent variable									
	Job satisfaction Time 2									
	B	*SE B*	*β*	*t*	*F*	*p*	*Adj. R^2*	*ΔF*	*Δp*	*ΔR^2*
Independent variable										
Step 1					23.02	< .001	.27			
Job satisfaction Time 1	.52	.11	.53***	4.80						
Step 2					7.93	< .001	.26	0.56	.58	.01
Job satisfaction Time 1	.55	.12	.56***	4.79						
Job demand Time 1	.13	.13	.13	0.99						
Job demand Time 2	-.03	.13	-.03	-0.21						
Step 3					6.71	< .001	.28	2.44	.12	.03
Job satisfaction Time 1	.51	.12	.52***	4.42						
Job demand Time 1	.15	.13	.16	1.21						
Job demand Time 2	-.06	.13	-.06	-0.47						
Privacy fit Time 1	.03	.02	.18	1.56						
Step 4					7.18	< .001	.34	6.45	.01	.07
Job satisfaction Time 1	.43	.12	.44***	3.77						
Job demand Time 1	.11	.12	.12	0.94						
Job demand Time 2	-.04	.13	-.04	-0.32						
Privacy fit Time 1	.01	.02	.04	0.29						
Privacy fit Time 2	.05	.02	.32**	2.54						

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table F.5

Autoregression: Privacy fit on workplace satisfaction (Study 4)

	Dependent variable									
	Workplace satisfaction Time 2									
	B	*SE B*	*β*	*t*	*F*	*p*	*Adj. R^2*	*ΔF*	*Δp*	*ΔR^2*
Independent variable										
Step 1					2.75	.10	.03			
W. satisfaction Time 1	.21	.13	.21	1.66						
Step 2					1.31	.28	.02	0.60	.55	.02
W. satisfaction Time 1	.17	.13	.18	1.28						
Job demand Time 1	-.11	.31	-.05	-0.33						
Job demand Time 2	-.22	.31	-.11	-0.70						
Step 3					4.44	.003	.19	13.02	< .001	.18
W. satisfaction Time 1	.11	.12	.11	0.91						
Job demand Time 1	.02	.29	.01	0.08						
Job demand Time 2	-.35	.28	-.18	-1.25						
Privacy fit Time 1	.15	.04	.43***	3.61						
Step 4					12.46	< .001	.49	34.05	< .001	.29
W. satisfaction Time 1	.07	.10	.07	0.68						
Job demand Time 1	-.12	.23	-.06	-0.52						
Job demand Time 2	-.21	.23	-.10	-0.91						
Privacy fit Time 1	.04	.04	.13	1.18						
Privacy fit Time 2	.18	.03	.62***	5.84						

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table F.6

Autoregression: Privacy fit on emotional fatigue (Study 4)

	Dependent variable									
	Emotional fatigue Time 2									
	B	*SE B*	*β*	*t*	*F*	*p*	*Adj. R^2*	*ΔF*	*Δp*	*ΔR^2*
Independent variable										
Step 1					52.15	< .001	.46	52.15	< .001	.47
Emotional fatigue Time 1	.70	.10	.69***	7.22						
Step 2					16.84	< .001	.44	0.03	.97	.00
Emotional fatigue Time 1	.70	.11	.68***	6.14						
Job demand Time 1	-.02	.19	-.02	-0.13						
Job demand Time 2	.05	.18	.03	0.26						
Step 3					12.41	< .001	.43	0.00	.97	.00
Emotional fatigue Time 1	.69	.63	.68***	5.97						
Job demand Time 1	-.03	.19	-.02	-0.13						
Job demand Time 2	.05	.19	.03	0.26						
Privacy fit Time 1	-.001	.03	-.003	-0.03						
Step 4					11.37	< .001	.47	4.31	.04	.04
Emotional fatigue Time 1	.62	.12	.61***	5.22						
Job demand Time 1	.05	.19	.03	0.27						
Job demand Time 2	.02	.18	.01	0.12						
Privacy fit Time 1	.03	.03	.10	0.93						
Privacy fit Time 2	-.06	.03	-.24*	-2.08						

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table F.7

Autoregression: Privacy fit on mental fatigue (Study 4)

	Dependent variable									
	Mental fatigue Time 1									
	B	*SE B*	*β*	*t*	*F*	*p*	*Adj. R^2*	*ΔF*	*Δp*	*ΔR^2*
Independent variable										
Step 1					41.89	< .001				
Mental fatigue Time 1	.64	.10	.64***	6.47						
Step 2					15.81	< .001	.43	2.04	.14	.04
Mental fatigue Time 1	.58	.11	.58***	5.33						
Job demand Time 1	.06	.16	.04	0.35						
Job demand Time 2	.23	.15	.18	1.53						
Step 3					12.49	< .001	.43	1.83	.18	.02
Mental fatigue Time 1	.58	.11	.59***	5.45						
Job demand Time 1	.02	.16	.01	0.10						
Job demand Time 2	.26	.15	.20	1.71						
Privacy fit Time 1	-.03	.02	-.13	-1.35						
Step 4					14.42	< .001	.53	12.19	< .001	.10
Mental fatigue Time 1	.56	.10	.56***	5.65						
Job demand Time 1	.07	.15	.06	0.50						
Job demand Time 2	.21	.14	.16	1.49						
Privacy fit Time 1	.01	.02	.05	0.44						
Privacy fit Time 2	-.07	.02	-.36***	-3.49						

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table F.8

Autoregression: Privacy fit on stress (Study 4)

	Dependent variable									
	Stress Time 1									
	B	*SE B*	*β*	*t*	*F*	*p*	*Adj. R^2*	*ΔF*	*Δp*	*ΔR^2*
Independent variable										
Step 1					28.27	< .001	.31			
Stress Time 1	.55	.10	.57***	-0.65						
Step 2					19.48	< .001	.48	10.52	< .001	.18
Stress Time 1	.27	.13	.27*	2.13						
Job demand Time 1	.22	.18	.17	1.21						
Job demand Time 2	.55	.15	.41***	3.60						
Step 3					14.83	< .001	.48	0.95	.34	.01
Stress Time 1	.25	.13	.26	2.00						
Job demand Time 1	.21	.18	.16	1.14						
Job demand Time 2	.57	.16	.42***	3.70						
Privacy fit Time 1	-.02	.02	-.09	-0.97						
Step 4					12.79	< .001	.50	2.77	.10	.02
Stress Time 1	.20	.13	.21	1.58						
Job demand Time 1	.27	.18	.21	1.48						
Job demand Time 2	.55	.15	.41***	3.60						
Privacy fit Time 1	-.002	.02	-.01	-0.07						
Privacy fit Time 2	-.04	.02	-.18	-1.66						

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table F.9

Autoregression: Coping appraisal on job satisfaction (Study 4)

	Dependent variable									
	Job satisfaction Time 2									
	B	*SE B*	*β*	*t*	*F*	*p*	*Adj. R^2*	*ΔF*	*Δp*	*ΔR^2*
Independent variable										
Step 1					23.02	< .001	.27			
Job satisfaction Time 1	.52	.11	.53***	4.80						
Step 2					7.93	< .001	.26	0.57	.58	.01
Job satisfaction Time 1	.55	.12	.56***	4.79						
Job demand Time 1	.13	.13	.13	0.99						
Job demand Time 2	-.03	.13	-.03	-0.21						
Step 3					6.02	< .001	.25	0.51	.48	.01
Job satisfaction Time 1	.51	.13	.52***	4.00						
Job demand Time 1	.14	.13	.15	1.09						
Job demand Time 2	-.05	.13	-.05	-0.35						
Coping appraisal Time 1	.07	.09	.09	0.71						
Step 4					10.17	< .001	.43	19.01	< .001	.18
Job satisfaction Time 1	.41	.11	.42***	3.61						
Job demand Time 1	.07	.11	.08	0.65						
Job demand Time 2	-.04	.12	-.05	-0.38						
Coping appraisal Time 1	-.09	.09	-.13	-1.07						
Coping appraisal Time 2	.38	.09	.50***	4.36						

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table F.10

Autoregression: Coping appraisal on workplace satisfaction (Study 4)

	Dependent variable									
	Workplace satisfaction Time 2									
	B	*SE B*	*β*	*t*	*F*	*p*	*Adj. R^2*	*ΔF*	*Δp*	*ΔR^2*
Independent variable										
Step 1					2.75	< .001	.03			
W. satisfaction Time 1	.21	.13	.21	1.66						
Step 2					1.31	.28	.02	0.6	.55	.02
W. satisfaction Time 1	.17	.13	.18	0.18						
Job demand Time 1	-.11	.31	-.05	-0.05						
Job demand Time 2	-.22	.31	-.11	-0.70						
Step 3					4.25	.005	.18	12.29	.001	.17
W. satisfaction Time 1	-.06	.14	-.06	-0.43						
Job demand Time 1	-.03	.29	-.02	-0.11						
Job demand Time 2	-.35	.29	-.17	-1.21						
Coping appraisal Time 1	.74	.21	.48**	3.51						
Step 4					8.63	< .001	.39	20.32	< .001	.21
W. satisfaction Time 1	-.002	.12	-.002	-0.02						
Job demand Time 1	-.13	.25	-.07	-0.53						
Job demand Time 2	-.29	.25	-.15	-1.18						
Coping appraisal Time 1	.27	.21	.17	1.28						
Coping appraisal Time 2	.83	.18	.53***	4.51						

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table F.11

Autoregression: Coping appraisal on emotional fatigue (Study 4)

	Dependent variable									
	Emotional fatigue Time 2									
	B	*SE B*	*β*	*t*	*F*	*p*	*Adj. R^2*	*ΔF*	*Δp*	*ΔR^2*
Independent variable										
Step 1					52.15	< .001	.46			
Emotional fatigue Time 1	.70	.10	.69***	7.22						
Step 2					16.84	< .001	.44	0.03	.97	.001
Emotional fatigue Time 1	.69	.11	.68***	6.14						
Job demand Time 1	-.02	.19	-.02	-0.13						
Job demand Time 2	.05	.18	.03	0.26						
Step 3					12.41	< .001	.43	0.002	.96	.00
Emotional fatigue Time 1	.69	.12	.68***	5.69						
Job demand Time 1	-.03	.19	-.02	-0.13						
Job demand Time 2	.05	.19	.03	0.26						
Coping appraisal Time 1	-.01	.13	-.01	-0.05						
Step 4					11.26	< .001	.46	4.01	.05	.04
Emotional fatigue Time 1	.72	.12	.71***	6.03						
Job demand Time 1	.003	.19	.002	0.02						
Job demand Time 2	.02	.18	.02	0.13						
Coping appraisal Time 1	.14	.15	.12	0.99						
Coping appraisal Time 2	-.27	.14	-.22*	-2.00						

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table F.12

Autoregression: Coping appraisal on mental fatigue (Study 4)

	Dependent variable									
	Mental fatigue Time 1									
	B	*SE B*	*β*	*t*	*F*	*p*	*Adj. R^2*	*ΔF*	*Δp*	*ΔR^2*
Independent variable										
Step 1					41.89	< .001	.41			
Mental fatigue Time 1	.64	.10	.64	6.47						
Step 2					15.81	< .001	.43	2.04	.14	.04
Mental fatigue Time 1	.58	.11	.58***	5.33						
Job demand Time 1	.06	.16	.04	0.35						
Job demand Time 2	.23	.15	.18	1.53						
Step 3					12.29	< .001	.43	1.40	.24	.01
Mental fatigue Time 1	.57	.11	.57***	5.32						
Job demand Time 1	.02	.16	.02	0.11						
Job demand Time 2	.26	.15	.20	1.68						
Coping appraisal Time 1	-.12	.10	-.12	-1.19						
Step 4					12.57	< .001	.49	7.74	.007	.07
Mental fatigue Time 1	.62	.10	.62***	6.04						
Job demand Time 1	.04	.15	.03	0.28						
Job demand Time 2	.24	.15	.18	1.62						
Coping appraisal Time 1	.04	.11	.04	0.37						
Coping appraisal Time 2	-.31	.11	-.30**	-2.78						

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table F.13

Autoregression: Coping appraisal on work stress (Study 4)

	Dependent variable									
	Stress Time 1									
	B	*SE B*	*β*	*t*	*F*	*p*	*Adj. R^2*	*ΔF*	*Δp*	*ΔR^2*
Independent variable										
Step 1					28.27	< .001	.31			
Stress Time 1	.55	.10	.57***	5.32						
Step 2					19.48	< .001	.48	10.52	< .001	.18
Stress Time 1	.27	.13	.27*	2.13						
Job demand Time 1	.22	.18	.17	1.21						
Job demand Time 2	.55	.15	.41**	3.60						
Step 3					14.36	< .001	.47	0.01	.92	.00
Stress Time 1	.26	.13	.27	2.00						
Job demand Time 1	.22	.18	.17	1.20						
Job demand Time 2	.55	.16	.41**	3.53						
Coping appraisal Time 1	-.01	.11	-.01	-0.11						
Step 4					11.29	< .001	.46	0.04	.85	.00
Stress Time 1	.26	.13	.27	1.94						
Job demand Time 1	.22	.19	.17	1.18						
Job demand Time 2	.56	.16	.41**	3.51						
Coping appraisal Time 1	-.02	.12	-.02	-0.19						
Coping appraisal Time 2	.02	.12	.02	0.19						

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$.

Appendix G: Materials used in Study 5

Study 5 Participant Information Sheet

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Participant Information Sheet [version 02, 20/06/17]

Your workplace experience at the Aldgate office

Introduction
I would like to invite you to take part in a research project. Before you decide to participate you need to understand why the research is being done and what it will involve for you. Please take the time to read the following information carefully and ask questions about anything you do not understand.

What is the purpose of the study?
The purpose of this study is to understand how you experience your new work environment at the Aldgate office and how you helps or hinders to regulate privacy at work.

Why have I been invited to take part in the study?
You have been invited to participate in this interview because you have indicated in a recent survey that you would be interested to do so.

About 24 employees from AECOM will be asked to take part in the interviews.

Do I have to take part?
No, you do not have to participate. There will be no adverse consequences, if you decide not to participate or withdraw at a later stage. You can withdraw your participation at any time without prejudice.

If you withdraw from the study, anonymous data already collected will be used. No further data would be collected.

What will my involvement require?
Before the interview
If you agree to take part, you will be asked to sign a consent form.
Further, you will be given this information sheet to keep and a copy of your signed consent form. The data collection phase will last till end of July but your involvement would only be for this interview session.

In preparation for the interview, the researcher will ask you for the respondent ID which you generated for the previous survey ("Your Workplace Experience & Well-being at Work", March 2017). Further, the researcher will ask for your permission to use the code to access your responses to the survey's privacy scale to generate your individual privacy score. No other survey data will be accessed.

Before the interview begins, you will be given a short demographic questionnaire.

During the interview
In the interview, you will be asked to answer questions about your day to day activities at work and the work locations you mostly use. You will be asked general questions about privacy at work and specific questions about your privacy experience at the Aldgate office. You will be asked to recall work situations which you experienced as stressful and talk about your thoughts and feelings.

You will be shown some scenarios about typical work situations and I would like you to express your thoughts to these scenarios. You will be asked to talk about your experience of working at the Aldgate office in comparison to the MCP office.

What will I have to do?
Filling out the demographic questionnaire and answer to the interview questions as honestly as possible.

There are no right or wrong answers – just answer what comes to mind.

The interview should take approx. 30 minutes.

What will happen to data that I provide?
The records will be collected on a mobile phone and will be uploaded to the university file server. Research data are stored securely for at least 10 years following their last access and project data (related to the administration of the project, e.g. your consent form) for at least 6 years in line with the University of Surrey policies.

Personal data will be handled in accordance with the UK Data Protection Act (1998) and only be handled by the research team at the University of Surrey. No other party (including AECOM) will have access to your personal data.

With your consent, to make the most of your participation and support efficient advancements in science, any anonymised data may be used for future research. The research team is unable tell you at this moment in time what this research will entail or what analyses will be carried out but the researcher can assure you that all appropriate legal, ethical and other approvals will be in place. For practical reasons your consent will not be sought again.

What are the possible disadvantages or risks of taking part?
As I will ask you to recall a stressful situation at work, you might be reminded about the feelings you experienced. Other than that, there are no foreseeable disadvantages or risks by taking part in this study.

What are the possible benefits of taking part?
By contributing to this study you would help advance research and give insights into how workplaces can support or hinder privacy regulation at work. Further, you would help the researcher to progress with her PhD.

What happens when the research study stops?
Anonymised verbal recording will be send to external transcription service. Transcripts will be coded and analysed. Anonymised results will be presented in reports/papers and will potentially be published.

What if there is a problem?
Any complaint or concern about any aspect of the interview will be addressed; please contact Clara Weber, the Principal Investigator on [07921 646142, c.f.weber@surrey.ac.uk] in the first instance or my Supervisor Dr. Birgitta Gatersleben [b.gatersleben@surrey.ac.uk]. You may also contact Hilary Jeffery at AECOM who is overseeing this research project.

Will my taking part in the study be kept confidential?
Yes. Your details will be held in complete confidence and the researcher will follow ethical and legal practice in relation to all study procedures. Personal data [name, contact details, audio recordings] will be handled in accordance with the UK Data Protection Act 1998 so that unauthorised individuals will not have access to them.

Your personal data will be accessed, processed and after a certain period securely destroyed by members of the research team.

The data you provide will be anonymised and your personal data will be stored securely separately from those anonymised data.

You will be given a participant code and results will be presented with this participant code. You will not be identified in any reports or publications resulting from this research and those reading them will not know who has contributed to it. With your permission the researcher would like to use anonymous verbatim quotation recordings in reports.

With your permission the researcher would like to use an external transcription service to transcribe the anonymised recordings.

Full contact details of researcher and supervisor

Clara Weber
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07921646142

Dr. Birgitta Gatersleben
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Surrey
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Who is organising the research?

This research is organised by the University of Surrey and AECOM.

What is the ethical status of this research project?

This research is being conducted according to the provisions of the University of Surrey Ethics Handbook for Teaching and Research.

Thank you for taking the time to read this Information Sheet.

Study 5 Consent Form

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Consent Form [version 02, 20/06/17]

Your workplace experience at the [name of new office]

Please initial each box

- I have read and understood the Information Sheet provided (version 02, 20/06/17). I have been given a full explanation by the investigators of the nature, purpose, location and likely duration of the study, and of what I will be expected to do. ☐
- I have been advised about any discomfort on my health and well-being which may result. I have been given the opportunity to ask questions on all aspects of the study and have understood the advice and information given as a result. ☐
- I agree to comply with the requirements of the study as outlined to me to the best of my abilities. I shall inform the investigators immediately if I have any concerns. ☐
- I agree to provide my respondent ID which I generated for a previous survey ("Your Workplace Experience & Well-being at Work", March 2017). I allow the researcher to use my respondent ID to access my survey data to generate my privacy score. ☐
- I agree for my anonymised data to be used for this study and future research that will have received all relevant legal, professional and ethical approvals. ☐
- I give consent to the interview being audio recorded. ☐
- I give consent to anonymous verbatim quotation being used in reports and other forms of documentation. ☐
- I understand that all project data will be held for at least 6 years and all research data for at least 10 years in accordance with University policy and that my personal data is held and processed in the strictest confidence, and in accordance with the UK Data Protection Act (1998). ☐
- I agree for the researchers to contact me to provide me with a study results summary. ☐
- I agree for the researchers to contact me about further questions. ☐
- I agree that my anonymized data can be transcribed by an external service provider. ☐
- I agree for the results of my anonymised data to be shared with [company name]. ☐
- I understand that I am free to withdraw from the study at any time without needing to justify my decision, without prejudice. ☐
- I allow the researchers to use anonymous data already collected if I withdraw from the study. ☐
- I confirm that I have read and understood the above and freely consent to participating in this study. I have been given adequate time to consider my participation. ☐

When completed: 1 for participant; 1 for researcher site file {; 1 (original) to be kept in medical notes}.

Name of participant (BLOCK CAPITALS) .....

Signed .....

Date .....

Name of researcher* taking consent (BLOCK CAPITALS) Clara Weber

Signed .....

Date .....

When completed: 1 for participant; 1 for researcher site file {; 1 (original) to be kept in medical notes}.

Study 5 Demographic Questionnaire

Demographic Questionnaire

The reason that I ask for this information is to demonstrate that I have obtained the views of a cross-section of people. The information that you give will never be used to identify you in any way. **However, if you don't want to answer some of these questions, please don't feel that you have to.**

1. Are you
   Female__ Male__

2. How old are you?
   [ ] years

3. How would you describe your ethnic origins?[1]
   Choose one section from (a) to (e) and then tick the appropriate category to indicate your ethnic background.

   White
   English/Welsh/Scottish/Northern Irish/British __
   Irish __
   Gypsy or Irish Traveller __
   Any other White background _____

   Mixed/multiple ethnic groups
   White and Black Caribbean __
   White and Black African __
   White and Asian __
   Any other mixed background _____

   Asian or Asian British
   Indian __
   Pakistani __
   Bangladeshi __
   Chinese __
   Any other Asian background _____

   Black/African/Caribbean/Black British
   African __
   Caribbean __
   Any other Black/African/Caribbean background _____

   Other ethnic group
   Any other ethnic group, please write in here _____

4. Are you working full-time or part-time?
   Full-time __ Part-time __

5. Which department do you work in? _____

6. What is your job role and title? _____

7. Do you have managerial or project leading responsibilities?
   Yes__ No __

8. For how many years do you work for [company name]?
   [ ] years

9. Have you worked at [name new office]? If so, for how long?
   Yes __ No __ [ ] years

10. Before working at [company name], have you worked in an open-plan office before? If so, for how long?

[1] The format of this question is taken from the 2011 UK census.

Study 5 Interview Schedule

Interview Schedule [version 02, 20/06/17]

1) **Could you describe a typical work day when you are working in the [Name of new office]?**
   - With which tasks do you spent most of your time on a typical day?
     - Ratio of concentrated work & collaborative work
   - Where do you do these tasks?
2) **What does the term "privacy" at work mean to you? How would you define it?**
   - Not been overheard and overseen, confidentiality

Privacy has been defined as "regulating output we make to others and input we get from others".

3) **Taking your understanding of privacy and the just mentioned definition into account, when do you need privacy at work? Could you tell me about these situations?**
   - Specific task requirement, mood, when you are generally un-concentrated, personal preference
   - How often do you need privacy at work during a typical week?

You have giving your consent to access your privacy score from the last survey. Your privacy score is _____ [interviewer to write in score and range]. This score suggests that your needs for privacy are >> frequently not met when you work in the Aldgate office << __ >> frequently met when you work in the Aldgate office [interviewer to cross out one to the options].

4) **Do you think this privacy is representative for your experience?**
5) **What do you general think about privacy regulation in this open plan office? Do you feel you are in control over the input you get from others and the output you make to others?**
   - What would need to change to give you that sense of control? (Culture, environment etc.)
6) **Are there aspects at work make it particularly easy or particularly hard to act on your privacy needs?**
   - Easy:
     - Working wherever you want/flexi-time, WFH
     - Environmental enablers e.g. quiet room, having my personal workspace facing away from foot traffic, having something in the back
     - Culture: Can you freely say if someone is disrupting you
   - Hard:
     - The nature of the job content or your job role e.g. role conflict
     - Protocols not acted upon
     - Cultural barriers – workplace autonomy vs. presenteeism
     - Environmental hurdles e.g. not enough quiet booths, no visual panels

7) **[If applicable for interviewee] In September 2016, you moved from your office at [name of old office] to [name of new office], was it any different to work at [name of old office] when you wanted privacy?**
   - What was better, and what was worse? i.e. own desk, informal meetings areas, breakout, workspace numbers, arrangement of desk, co-location
   - Regarding the setup, was it a more or less stressful to work at [name of old office]? Why?
8) **Could you describe the most stressful situation at work which you have experienced in the last 3 months in which you wanted/needed more privacy than you had?**
   - What at did you <u>think</u> at that moment
     - What did the situation mean to you (<u>significance</u>)
     - Did you think you <u>could something</u> about the situation?
     - What is the worst that could have happened (<u>consequences</u>)? Did you visualise this?
   - How did you <u>feel</u> during the situation
   - What would you have liked to change if possible?
   - What was the outcome of the stress situation (<u>consequences</u>)?
   - <u>How often</u> does something like this happen at work?
9) **I am going to show you a couple of scenarios. Could you please go through each one of them and tell me what you think about them? Just tell me what first comes to mind.**
10) **We are coming to the end of the interview, is there anything else you want to mention?**

<u>Scenarios</u>

1. There is a lot happening visually and verbally around you at work.
2. Over the course of your work day, colleagues approach you regularly.
3. Colleagues who are sitting on the same bench as you are having conversations across the tables.
4. The office is very quiet and you need to discuss something with a co-worker sitting close to you.
5. You are feeling emotional and you need to be very productive.
6. You want to have a confidential conversation face-to-face.
7. You want to have a confidential conversation on the phone.
8. You are doing some work which you do not want colleagues around you to see (for whatever reason).
9. You are working on a task that is mentally very taxing and will take up most of your day at work.
10. You are feeling emotional and you need to be very productive.
11. You are feeling mentally, emotional, or physiological fatigued and you need to be very productive.
12. You are having a tense discussion with a colleague over work.
13. You have to admit to your colleague who is standing next to you, that you have no idea about how you go about solving a task, although you should know.